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A REVISION OF THE SPECIES IN *AGROMYZA* FALLEN, AND *CERODONTA* RONDANI. (DIPTERA).

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The work on the two genera presented in this paper has been undertaken for the purpose of deciding the identity and distinctions of several species affecting field and forage crops, upon which considerable work has been done by the field agents of the division dealing with the insects affecting these crops. In some cases it has been found necessary to change the names of certain American species, as examination has proved that they are either synonymous with other American species or with species belonging to the European fauna. In the case of some other species it may at some future time become necessary to sink the American species as synonymous with European forms, but owing to the most unsatisfactory condition of the knowledge of the species contained in this family (*Agromyzidæ*) in Europe, it is not possible to definitely decide upon the correct names of their species from the brief descriptions available. Thus, while I suspect the distinctness of certain species in our fauna from others occurring in Europe, I consider it the safer plan, and one entailing no material disadvantages, to retain those species in our list, rather than rank them as synonyms of species which may ultimately prove to be absent from our fauna.

Generic Characters of *Agromyza*.

Head of normal size; frons broad, from one-third to a little over one-half the head width; ocelli on a slightly raised portion; the ocellar triangle, so distinct in the *Oscinidæ*, seldom traceable; orbits distinct, 3-5 pairs of orbital bristles present anterior to front ocellus; one pair of bristles on ocellar region slightly behind anterior ocellus, pointing forward and slightly divergent, vertical row consisting of two central divergent and two outer convergent bristles; postvertical bristles divergent; face nearly straight in vertical outline, or slightly concave, slightly keeled in center, or unkeeled; mouth margin not produced; antennæ of moderate size, or third joint enlarged, but never elongate or produced at apex; second joint with at least one dorsal setula; arista bare or pubescent, never plumose; cheeks linear or broadened posteriorly, sometimes one-half as high as eye, bristles confined to margin, vibrissa generally noticeably differentiated; proboscis membranous, not elongated noticeably nor geniculate; palpi normal. Mesonotum with 2-4 pairs of dorso-centrals; mesopleuræ with 1-3 long posterior bristles as well as generally a number of setulæ; one or two bristles above mid coxæ and generally numerous setulæ; propleural bristle strong; squamæ distinct. Ovipositor of female generally with base chitinized, apex seldom protruding; male hypopygium of moderate size, not incurved. Legs without preapical bristle on dorsal surface; end spurs weak. Wings with subcostal vein weak, sometimes incomplete, but generally complete and ending very near to first vein, or fused with first at near apex; costa at end of subcosta uninterrupted, or only slightly so; costal vein with very short hairs which are, with exception of two slightly more distinct at end of subcosta, of almost equal length to beyond middle of wing; cross veins near to wing base, or the outer one at, or slightly beyond, wing middle; posterior basal cell always complete though small; anal vein (sixth) distinct; costa to third vein, slightly beyond it, or to fourth. This last character is difficult to distinguish sometimes, and is not of sufficient importance to permit of the relegation of those species having costa to only third vein, to a different genus from those with costa to fourth.

Synoptic Table of Species in *Agromyza*.

1. Halteres white, or pale yellow; (*maculosa* has a black spot on outer side)...2
Halteres black or brown, never pale yellow.....40
2. Species with the disk of scutellum entirely or partly pale yellow.....3
Species with disk of scutellum colored as mesonotum, and never in part pale yellow.....11
3. At least the apical joint of antennæ black.....4
Antennæ entirely yellow, or third joint only slightly infuscated.....5 6
4. Frons black, only the frontal lunule yellow.....1. *xanthophora* Schiner.
Frons yellow, only the ocellar triangle black, and sometimes the posterior part of orbits darkened.....2. *longispinosa*, new species.
5. No short setulæ on disk of mesonotum between the dorso-central bristles..6
6. Mesonotum with the disk broadly black, only the lateral margins broadly, and the anterior and posterior margins yellow.....7
Mesonotum with black, stripe-like marks, or disk black, the center of disk in front of scutellum yellow, owing to the abbreviation of central stripe..8
7. Third antennal joint and palpi, at apices, infuscated..2a. *variata*, new species.
Third antennal joint and palpi entirely yellow.....7a
- 7a. Mesonotum bare except for the dorso-central bristles..3 *discalis*, new species.
Mesonotum with discal setulæ in addition to dorso-centrals.....7b
- 7b. Smaller species, 1-1.75 mm., last section of fifth vein $2\frac{1}{2}$ to 3 times as long as the penultimate section.....4 *pusilla* Meigen.
Larger species, 2-2.5 mm., last section of fifth vein $1\frac{1}{2}$ to 2 times as long as penultimate section.....5 *scutellata* Fallen.
8. Only the margins of the discal marks on mesonotum black, the center portions reddish brown.....8 *melampyga* var. *marginalis*, new variety.
Markings on mesonotum unicolorous throughout.....9
9. Markings on mesonotum dull gray black, not glossy..6 *borealis*, new species.
Markings on mesonotum glossy black.....10
10. Cheeks, posteriorly, about one-half the eye height; arista almost bare.
7 *flavonigra* Coquillett.
Cheeks, posteriorly, much less than one-half the eye height; arista pubescent.....8 *melampyga* Loew.
11. Costa reaching to third vein or slightly beyond.....12
Costa reaching to fourth vein.....17
12. Frons lemon yellow; cross veins very close together.....13
Frons reddish or black, never pale yellow.....14
13. Lateral margins of mesonotum broadly pale yellow; anterior two pairs of dorso-centrals on mesonotum much weaker than the posterior two pairs, the front pair not anterior to suture.....9. *brevicostalis* new species.
Lateral margins of mesonotum colored as disk; anterior two pairs of dorso-centrals not much reduced in size, the front pair distinctly anterior to suture.....10 *davisi* Walton.
14. Frons black; cross veins not close together.....15
Frons reddish; cross veins close together.....16
15. Pubescence on arista indistinct; occiput not projecting much on upper half.
11 *abbreviata* new species.
Pubescence on arista distinct; occiput distinctly projecting on upper half.
12 *kincaidi* new species.
16. Slender, slightly shining, black species; mesonotum with four pairs of dorso-central bristles.....13 *parvicella* Coquillett.
Robust, glossy black species; mesonotum with two pairs of dorso-central bristles.....14 *nitida*, new species.
17. Frons entirely yellow, or at least the center stripe mostly yellow or reddish, or the orbits yellow posteriorly.....18
Frons entirely black or brown, never yellow on any part; frontal lunule sometimes white dusted.....27

18. Mesonotum opaque gray; center of disk between the rows of dorso-central bristles with a yellowish-brown, longitudinal vitta, which extends on to disk of scutellum; three pairs of orbital, and four pairs of dorso-central bristles present.....15 *immaculata* Coquillett.
Mesonotum shining, or, if opaque grayish there is no indication of a central brown vitta.....19
19. Antennæ entirely yellow, or third joint only darkened at insertion of arista.*
20
Antennæ with at least the third joint black, or dark brown, never yellow..23
20. Head, including antennæ, clear lemon yellow, only ocellar region, orbits posteriorly, and back of head black, or brown; pleuræ and legs lemon yellow with black or brown marks; lateral margins of mesonotum brown.
16 *citreifrons*, new species.
Frons and face mostly, or entirely, reddish yellow; lateral margins of mesonotum pale yellow, or black and concolorous with disk of mesonotum...21
21. Five equally strong orbital bristles present; frons one-half as broad as head; orbits not differentiated from center stripe; mesonotum with four pairs of dorso-centrals.....17 *pruinosa* Coquillett.
Four orbital bristles present; orbits differentiated from center stripe....22
22. Lateral margins of mesonotum pale yellow; wings narrow; outer cross vein before wing middle; last section of fourth vein three times as long as the two preceding sections together.....18 *indecisa*, new species.
Lateral margins of mesonotum not pale yellow; wings broad; outer cross vein at near wing middle; last section of fourth vein twice as long as two preceding sections together.....19 *varifrons* Coquillett.
23. Lateral margins of mesonotum broadly pale yellow.....24
Lateral margins of mesonotum narrowly, or not at all, yellow, the pale color confined almost entirely to the suture, or to the extreme upper margin of the pleuræ.....25
24. Frons with the center stripe clear yellow; orbits posteriorly, sometimes, blackened; legs black, or brown, the knees never distinctly yellow....
20 *platyptera* Thomson.
Frons with the center stripe more or less blackened; legs with the knees distinctly pale yellow.....21 *coquilletti*, new species
25. Palpi yellow.....22 *longipennis* Loew.
Palpi black.....26
26. Larger species—3-3½ mm.—dull gray-black in color; apices of femora and bases of tibiæ narrowly yellow.....23 *coloradensis*, new species.
Smaller species—1½-2 mm.—shining black in color; apical half of each femur yellow, tibiæ brownish yellow.....24 *marginata* Loew.
27. Mesonotum with four, or more, pairs of dorso-central bristles.....28
Mesonotum with two or three pairs of dorso-central bristles.....35
28. The pair of bristles between the posterior pair of dorso-central almost of equal strength with them; basal two joints of antennæ, legs mostly, pleuræ, humeri, and abdomen reddish yellow; outer cross vein beyond wing middle.....25 *canadensis*, new species.
The pair of bristles mentioned above much weaker than posterior dorso-centrals, or absent; much darker species; only sometimes a narrow side line on pleuræ, knee joints more or less broadly, and posterior margins of abdominal segments narrowly yellow; or entire thorax, abdomen and legs black, cross vein generally at or before wing middle or very slightly beyond it.....29
29. Third antennal joint in male enlarged, subquadrate, thickly covered with short, silky pilosity; in female the third joint is smaller and not so noticeably pilose; frontal lunule distinct, whitish pollinose; center stripe of frons brownish.....26 *laterella* Zetterstedt...
Third antennal joint normal in size in both sexes, and not noticeably pilose..30

*Sometimes *longipennis* has the antennæ yellowish, in which case the specimens will run down to *indecisa* when a comparison of the descriptions will be necessary.

30. Halteres pale yellow, with a black spot on outer side of knob; dorso-central bristles strong, anterior pairs almost as strong as posterior pairs; last section of fifth vein shorter than penultimate section.....
27 maculosa, new species.
 Halteres without any dark spot on knob.....31
31. Outer cross vein at about the length of inner cross vein from that vein; third and fourth veins very distinctly divergent at apices.....
28 waltoni, new species.
 Outer cross vein separated by a greater distance than inner cross vein from that vein; third and fourth veins slightly divergent at apices.....32
32. Small species, at most 2 mm., base of wing, including basal half of first vein, upper part of pleuræ and mesopleural vertical suture narrowly, a small patch below base of wing, squamæ, and fringe lemon yellow; general color shining black; outer cross vein below, or at very slightly beyond end of first vein.....*29 angulata* Loew.
 Species other than above in color, etc.....33
33. Larger species, 3 mm. and over, almost entirely black-brown; lower half of orbits rather closely set with hairs.....*30 setosa* Loew.
 Smaller species, about 2 mm., not so uniformly colored; lower half of orbits sparsely haired.....34
34. Rather robust species; wings broad; cheeks linear; tibiæ and tarsi yellowish.
31 isolata, new species.
 More slender species; wings narrow; cheeks one-fourth as high posteriorly as height of eyes; tibiæ and tarsi barely paler than femora.....
32 fragariae, new species.
35. Species with three distinct pairs of dorso-central bristles.....36
 Species with 2 distinct parts of dorso-central bristles.....39
36. Glossy black species; base of wing, squamæ and small portion of pleuræ pale lemon yellow; frons not one-third the width of head; anterior pair of dorso-central bristles strong; arista as long as from its base to anterior ocellus; frontal lunule yellowish, distinctly white pollinose; male with apical segments of abdomen conspicuously pale yellow.....
33 posicata Meigen
 Apex of abdomen in male not yellow; frontal lunule not yellow, not noticeably white pollinose.....37
37. Smaller species, less than 2 mm. in length.....38
 Larger species, over 2 mm. in length.....*36 dubitata*, new species.
38. Last section of fifth vein distinctly shorter than penultimate section.....
34 neptis Loew.
 Last section of fifth vein distinctly longer than penultimate section.....
35 inconspicua, new species.
39. Abdomen black, without any metallic sheen; antennæ brownish; arista distinctly pubescent.....*37 parvicornis* Loew.
 Abdomen black, with a metallic, bluish, or greenish sheen; antennæ black; arista never distinctly pubescent.....*38 viridula* Coquillett.
40. Costa to end of third vein.....41
 Costa to end of fourth vein.....43
41. Arista short, not more than three times as long as breadth of third antennal joint, distinctly pubescent; outer cross vein at its own length from inner cross vein; three pairs of dorso-central bristles on mesonotum.....
39 salicis, new species.
 Arista bare; mesonotum with two pairs of dorso-centrals.....42
42. Cheeks very short, not higher posteriorly than anteriorly, and about one-sixth as high as eye; antennæ of moderate size; arista about three times as long as width of third joint.....*40 winnemanæ*, new species.
 Cheeks long, distinctly higher posteriorly than anteriorly, at highest part at least one-third as high as eye; antennæ rather small, arista about six times as long as width of third joint.....*41 simplex* Loew.

43. Male with anterior angle of cheek produced, the vibrissæ formed of a number of bristles, fasciculate, turned upward and generally ending in an acute joint; female with the mouth margin produced anteriorly, but without a fasciculus.....44
Mouth margin not produced anteriorly in either sex; male vibrissæ normal..47
44. Large species, over 3 mm. in length; cheeks of almost equal height at anterior and posterior margins; antennæ brownish; arista shortly and distinctly swollen at base; palpi almost entirely bare....42 *vibrissata*, new species.
Smaller species, generally less than 2.5 mm. in length; antennæ black; arista with elongate swelling; cheeks always higher anteriorly than posteriorly.....45
45. Small species, 1.5-2 mm.; frons weakly bristled; discal setulæ not carried beyond the transverse line of the posterior pair of dorso-centrals, generally ceasing distinctly in front of that point.....46
Larger species, 2-2.5 mm.; frons strongly bristled; discal setulæ carried at least to transverse line of posterior pair of dorso-centrals generally beyond that point.....43 *affinis*, new species.
46. Very small species, barely 1.5 mm.; vibrissæ in male not very prominent; the anterior angle of cheeks in neither sex much produced.....
44 *insularis*, new species.
Larger species, about 2 mm.; vibrissæ in male prominent; anterior angle of cheek in both sexes very distinctly produced...45 *texana*, new species.
47. Species with four distinct pairs of dorso-central bristles on mesonotum; outer cross vein at barely beyond end of first vein; last section of fifth vein twice as long as penultimate section..46**abnormalis*, new species.
Species with generally only two distinct, rarely three, pairs of dorso-centrals; the outer cross vein at distinctly beyond end of first vein, and the last section of fifth never twice as long as penultimate section.....48
48. Eyes bare.....49
Eyes with very distinct pubescence on the upper surface close to frontal orbits.....47 *virens* Loew.
49. Fore tibia with a distinct bristle on the posterior surface at about apical third.....50
Fore tibia without any distinct bristle at that point.....51
50. Thorax blue, abdomen bronzy-black; orbits with sparse pubescence and the bristles situated at nearer to the eye margin than to the inner margin; squamæ white, fringe concolorous.....48 *carulea*, new species.
Thorax black; abdomen bronzy; orbits thickly pubescent, the bristles situated on nearer to the inner margin than to the eye margin; squamæ grayish, margin and fringe brown.....49 *burgessi*, new species.
51. Arista with very long pubescence, much longer than basal diameter of arista.....50 *plumisetæ*, new species.
Arista with shorter pubescence, or entirely bare.....52
52. Mesonotum with three distinct pairs of dorso-centrals; large species, 3.5-4 mm. Larva living in galls on wistaria twigs....51 *websteri*, new species.
Mesonotum with only two distinct pairs of dorso-centrals; smaller species, not near 4 mm., generally 2.5 to 3 mm.....53
53. Squamæ grayish or brownish, margin and fringe always brown or blackish..54
Squamæ whitish or yellowish, fringe concolorous.....47 *virens* Loew.
54. Arista distinctly pubescent, and almost as long as from its base to vertex..
52 *longisetæ*, new species.
Arista much shorter, less distinctly pubescent.....55
55. Large species, 2-3 mm.; outer cross vein at less than its own length from inner, inner at distinctly beyond middle of discal cell.....56
Smaller species, distinctly less than 2 mm.....57
56. Mid tibial bristles distinct; larva in galls on lime trees..53 *tiliæ* Couder.
Mid tibial bristles absent; larva in galls on poplar trees..54 *schineri*, Giraud.
57. Mouth margin with numerous, rather strong bristles, which form a group, though not a fasciculus, at anterior angle...55 *congregata*, new species.
Mouth margin with the bristles as usual, the single vibrissa differentiated.
56 *minima*, new species.

1. *Agromyza xanthophora* Schiner.

Syn: *Agromyza xanthophora* Schiner, Reise d. Novara, Vol. I, 1868, p. 291.

Agromyza picta Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 188.

Female: Head black; frons opaque, orbits slightly shining, very narrow; ocellar region raised, sub-shining, distance between ocelli less than the distance from either ocellus to eye; lower orbital bristles cruciate, second pair slightly inwardly directed, the upper two pairs backwardly directed, the center pair in vertical row divergent, outer slightly convergent, post-vertical pair divergent. Frontal lunule yellow, with white pollinosity; face brown, sub-opaque, concave, unkeeled; cheeks almost linear, narrowest posteriorly, mouth margin with numerous hairs, and one strong incurved anterior vibrissa; antennæ black, third joint of moderate size, rounded, arista thin, slightly thickened at base, longer than the distance from its base to post-vertical bristle, thickly covered with pubescence, which is as long as the diameter of arista at base. Proboscis pale yellow; palpi black, slightly thickened. Thorax yellow; disk of mesonotum shining, but not glossy, with a black mark covering all but the margins anterior to the suture, which is sharply indented transversely at suture, subquadrate excised centrally on the posterior margin, does not reach to scutellum, and has a dentiform longitudinal excision in each lateral lobe posteriorly; four pairs of dorso-central bristles present, the anterior two pairs reduced in size, the anterior pair just in front of suture; all black portion of disk with short hairs, yellow portion bare, except for 5-6 scattered hairs present on the central posterior excision. Pleuræ with the upper half yellow, lower half black; squamæ yellow at base, apically black, the hairs brown; scutellum yellow, disk bare, margin with 4 bristles; postnotum black. Abdomen yellow, third and fourth segments with indications of a central and two lateral dark spots, most distinct on fourth; fifth and sixth segments glossy black; all segments with numerous black hairs which are bristle-like on posterior margins and most noticeable on fifth. Coxæ and legs entirely shining black; the mid tibia with the usual two posterior bristles. Wings slightly infuscated on anterior half; subcostal vein only indistinct at apex, costa from humeral vein to end of first vein about two-thirds as long as next costal division; second, third and fourth veins slightly divergent; outer cross vein as long as penultimate section of fourth, which is distinctly shorter than the preceding section of fourth; penultimate section of fifth slightly longer than last section. Halteres pale yellow.

Length, 3 mm.

Besides the type specimen of *picta* from Frontero, Tabasco, Mexico (C. H. T. Townsend), there is in the U. S. National Museum collection one female from Las Cruces, New Mexico, June, 1893, (T. D. A. Cockerell).

Food-plant unknown.

2. *Agromyza longispinosa*, new species.

Plate XXX, Fig. 22.

Male and Female: Head yellow, ocellar region, back of head, vertex, and third joint of antennæ black; frons opaque, very pale yellow, parallel-sided, distinctly broader than the eye; bristles as in *xanthophora*. Third joint of antennæ black, sharply contrasting with the pale yellow basal joints, regularly rounded and of moderate size; arista black-brown, swelling at base of terminal section elongate, almost as long as length of third antennal joint, pubescence very short, pale; face almost perpendicular, mouth margin not produced, cheeks distinctly higher posteriorly than anteriorly, at highest part about one-third as high as greatest eye-height, the row of bristles on mouth margin not very strong, black, the vibrissa of moderate strength; proboscis and palpi yellow; the latter slightly the darker, and weakly bristled. Mesonotum yellow, with opaque black-gray mark somewhat similar in outline to that of *xanthophora* but reaching more nearly to scutellum and more elongate owing to the species being less robust than *xanthophora*; the male shows some indication of a pale, linear stripe carried forward from the central posterior excision at either anterior angle, which may in some cases be so distinct as to cause the disk to present a trivittate appearance. Four pairs of very long dorso-central bristles present, the anterior two pairs but little reduced, the anterior pair distinctly anterior to the suture, and the second pair but little posterior to it; between the dorso-centrals there are two slightly irregular rows of setulæ, which are exceptionally long for this genus, and which are carried back as far as the prescutellar pair of dorso-centrals; humeri yellow, with a black spot; pleuræ yellow with a brownish spot above and slightly behind fore coxæ, another large one covering the space between the fore and mid coxæ, and another one between the mid and hind coxæ, squamæ with narrow black border, and brown fringe; scutellum yellow, bare on disk, the four marginal bristles very long; postnotum glossy black. Abdomen yellow, with apical segments darkened or with bases of all segments brownish; base of ovipositor in female glossy black; hypopygium in male glossy brownish black, of moderate size; all segments with black hairs much as in *xanthophora*. Legs yellow, tarsi brownish. Wings clear, veins 2-3 divergent, 3-4 almost parallel on last fourth; second portion of costa about two and one-half times as long as first; outer cross vein a little shorter than section of fourth vein anterior to it; first and second sections of fourth vein subequal; penultimate section of fifth vein distinctly shorter than ultimate.

Halteres yellow. Length, 1.5 mm.

Type—Cat. No. 15558, U. S. N. M.

Locality: Male: Bear Lake, British Columbia, July 20, 1903, (R. P. Currie).

Paratypes: Female—Kaslo, British Columbia, July 18, 1903, (R. P. Currie); female, same locality, July 7, 1903, (A. N. Caudell), and one one male ex. collection, Wm. Brodie, without locality, but presumably Canadian.

Food-plant unknown.

2a. *Agromyza variata*, new species.

Plate XXIX, Fig. 14.

Female: Frons lemon yellow, slightly over one-third the width of head; ocellar region black; orbits darkened on outer edge on upper half; five orbital bristles present; the anterior three closely placed and decreasing much in size to front one, which is very weak; an irregular row of weak hairs on orbits, laterally, beyond the bristles; antennæ of moderate size; yellow, third joint infuscated on apical half; arista brown, base swollen, pubescence very short; length of arista equal to a little more than twice the length of antenna; face and cheeks pale yellow; height of cheek posteriorly distinctly higher than anteriorly, at highest point less than one-fourth the height of eye, marginal bristles of moderate length, the vibrissa differentiated; proboscis yellow; palpi yellow, blackened and slightly dilated apically, occiput not visible on upper half. Mesonotum glossy black on disk, lateral margins and a large patch on center of posterior margin, which is rounded in front, pale lemon yellow; four pairs of dorso-centrals present, the disk except on the yellow parts covered with short black setulæ; pleuræ shining black, yellow along sutures and below wing base; squamæ yellow, darkened on margins, fringe brown; scutellum pale yellow on disk, a black spot on each side at base. Abdomen glossy black, posterior margins of segments narrowly yellow. Legs yellow, bases of coxæ, tibiæ except bases, and tarsi black; no bristles on posterior surface of mid tibia. Wings clear; inner cross vein at below end of first vein and at middle of discal cell; last section of fifth vein twice as long as penultimate section.

Halteres yellow.

Length, 1.5 mm.

Type: In collection C. W. Johnson.

Locality: Calais, Maine.

Food-plant unknown.

3. *Agromyza discalis*, new species.

Plate XXX, Fig. 21.

Female: Frons yellow, opaque, almost parallel-sided, except at near posterior margin, where the sides very abruptly diverge, in breadth it occupies less than one-third the width of head; orbits very narrow; four orbital bristles present; nearer to eye margin on orbit is an irregular row of very short hairs; ocellar region and back of head black; antennæ clear yellow, of less than average size; second joint with short dorsal bristle; third joint small, not longer than broad, rounded; arista black, yellowish for a short space at just beyond the rather distinct basal swelling; pubescence indistinguishable; length of arista equal to from its base to second uppermost orbital bristle, face yellow, perpendicular; cheeks yellow, twice as high at posterior margin as at anterior, and at highest part rather more than one-third as high as eye; marginal bristles weak; vibrissa moderately strong; proboscis brownish yellow;

palpi pale yellow, of normal size, bare. Mesonotum shining black on disk, finely granulose; lateral margins broadly pale yellow; humeri brown; four pairs of dorso-central bristles present, the posterior pair more widely separated and stronger than the others; in addition there is in the type an additional pair of bristles, slightly anterior to the front pair, which may be abnormal; no setulæ present between dorso-centrals on any part of disk; pleuræ glossy black, sutures narrowly yellow; squamæ pale yellow, fringe concolorous; scutellum pale yellow on disk, broadly black on sides; normal bristles four, but the type has an adventitious bristle close to base of posterior one on left side; post-notum glossy black. Abdomen glossy black; a narrow posterior marginal band on all segments, and a narrow longitudinal dorsal line on last three segments yellow; base of ovipositor glossy black; all segments with dorsal hairs, those on apex of sixth segment bristle-like. Legs yellow; blackened more or less on mid and hind coxæ; bases of femora; apices of tibiæ, and all tarsi; mid tibia without posterior bristles. Wings clear; first costal division one-half as long as second; subcostal vein distinct, outer cross vein at slightly before the end of first vein, and at about its own length from inner cross vein; last section of fifth vein four times as long as penultimate section; veins 2-3-4 gradually divergent on their last sections, the cells enclosed by these veins of equal width at below apex of second vein. Halteres yellow.

Length, 1.5 mm. -

Type: Cat. No. 15559, U. S. N. M.

Locality: Adamana, Arizona, May 7, 1903 (H. S. Barber) one female.

This species is so evidently distinct from those of the *pusilla* group that I consider it safe to describe it from a single specimen.

Food-plant unknown.

4. *Agromyza pusilla* Meigen.

Syn: *Agromyza pusilla* Meigen, Syst. Besch., Vol. 6, 1830, p. 185, species 60.

Agromyza pumila Meigen, l. c. p. 185, species 62.

Agromyza strigata Meigen, l. c. p. 186, species 63.

Agromyza exilis Meigen, l. c. p. 186, species 64.

Agromyza orbona Meigen, l. c. p. 186, species 65.

Agromyza pusio Meigen, l. c. p. 187, species 66.

Agromyza puella Meigen, l. c. p. 187, species 67.

Agromyza amoena Meigen, l. c. p. 187, species 68.

(?) *Agromyza blanda* Meigen, l. c. p. 188, species 69.

(?) *Phytomyza diminuta* Walker, Trans. Ent. Soc. Lond., n. ser. 4, 1857, p. 232.

Oscinis trifolii Burgess, Dept. Agric. Rept. 1879, p. 201.

Oscinis brassicæ Riley, Dept. Agric. Rept. 1884, p. 322.

The above synonymy is I am confident correct, as an examination of a large number of specimens from widely separated localities, including Europe, and many states in the Union, reared from different food plants proves that all the

minor differences used by Meigen for the separation of his species may be found in the same species. *Agromyza blanda* Meigen may be a different species as also may *A. annulipes* Meigen, species 61 of the series quoted in synonymy, but they may only be color varieties. The number of examples in existence representing Meigen's types of this group are as follows: *pusilla*, 1, (Paris); *annulipes*, 1, (Paris); *pumila*, 3, (Vienna); *exilis*, 1, (Paris); *pusio*, 1, (Paris); 2, (Vienna); *orbona*, 1, (Vienna); *puella*, 1 defective specimen, (Vienna); *amoena*, 1, (Paris); *blanda*, 1, (Paris).

Male and Female: Black, shining. Marked in most variable degree with yellow. Frons except ocellar region, and sometimes a narrow side stripe posteriorly, yellow; remainder of head parts except behind vertex, yellow. Mesonotum with a more or less broad yellow margin, which never extends distinctly round the anterior nor posterior margin; four pairs of dorso-central bristles present as well as numerous short hairs on disk; humeri with a black spot. Pleuræ with sometimes spots much as in *xanthophora* and at other times almost entirely black, with the sutures and upper margin yellow; scutellum entirely yellow, or yellow with black basal side spots, which in some cases extend almost round the entire margin and on to the disk; postnotum black. Abdomen yellowish with dark brownish bases to segments, black with pale apices to segments, or entirely shining black with the apical segment whitish, or yellowish, at apex. Legs almost entirely yellow, the tarsi only brownish, to legs almost entirely black with knee joints yellow, the femora generally less intensely black than other parts of legs. Mid tibia without distinct posterior bristles. Wings clear; second division of costa about two and one-half times as long as first section, third and fourth veins divergent at extremities; outer cross vein as long as or slightly shorter than the section of fourth anterior to it, basal two sections of fourth subequal or the second slightly the shorter; last section of fifth vein about three times as long as preceding section.

Halteres yellow.

Length, 1-1.75 mm.

This is a most variable species in color and is very widely distributed. The following is a list of states from which it is represented in the material I have examined. (A full list of American localities, with list of food-plants will appear in the economic bulletin, now ready for the press, dealing with this species).

Massachusetts, Connecticut, District of Columbia, Arizona, Wyoming, Texas, Colorado, California, Utah, Kansas, New Mexico, Indiana, Idaho, Florida and Virginia. It is probable that this species occurs all over the United States.

5. *Agromyza scutellata* Fallen.

Syn: *Agromyza scutellata* Fallen Dipt. Suec. *Agromyza*. 1823. 7. 3.

Agromyza flavicola var. Fallen, l. c. 6, 11.

Agromyza pictella Thomson, Fregat. Eugene. Resa, Dipt. 1851, 53, p. 609.

I have compared examples of the European species with those in collection representing *pictella* and am convinced they are identical. I have some slight doubts as to its specific distinctness, from the foregoing species, but consider it justifiable to retain it as separate species until I know something of the life history of *scutellata*, which has not been bred in this country.

Male and female: Similar in coloration to *pusilla* Meigen, except that the femora are generally the most intensely black portions of the legs and in no examples that I have seen is there any appearance of their being inclined to yellow, especially at base. In size this species is also larger and the wing neurotation is different. Otherwise, in bristling, etc., the species are identical.

The only American examples I have seen of *scutellata* are five from mountains near Claremont, California (C. F. Baker) and one from Williams, Arizona (H. S. Barber).

6. *Agromyza borealis* new species.

Plate XXIX, Fig. 10, Plate XXX, Fig. 23.

Female: This species is very close to *longispinosa*, but differs in being more robust, in having the frons reddish yellow, instead of pale yellow; the antennæ are reddish yellow; the arista is black, tapering from base to near middle, bare, and distinctly shorter than from its base to vertex; cheeks more than one-half the eye-height; marginal mouth bristles numerous, vibrissæ hardly differentiated. Mesonotum with the marks dull gray black; the posterior lateral stripes narrow, linear, distinctly separated from the inner lateral lobe; the central excision carried forward at its angles but not sufficiently to separate the inner lateral stripes from the central one on their whole length; four pairs of dorso-central bristles present, the anterior two pairs about two-thirds as large as the posterior pairs; the thorax is distinctly broader than in *longispinosa*, being almost subquadrate, in *longispinosa* it is at least one-third longer than broad; the small bristles between the dorso-centrals are at least four-rowed in *borealis*. The pleuræ and scutellum are bristled and colored as in *longispinosa*, the scutellum having two distinct dark lateral basal spots. Abdomen yellow, basal three segments brownish, next two with a brownish spot on each side, sixth with a central black spot; base of ovipositor glossy black, longer than sixth segment, which is not elongated, bristles as in *melampyga*. Legs yellow, tarsi slightly browned; mid tibiæ as in *longispinosa*, without the posterior bristles. Wings grayish, veins yellowish, except third which

is brown; outer cross vein more than its own length from inner cross vein, first and second sections of fourth vein equal; first portion of fifth two-thirds as long as last portion. Halteres yellow. Length, 1.5 mm.

Type: Cat. No. 15560, U. S. N. M.

Much as I dislike the idea of describing a new species from a single specimen, I believe that in this case I am justified in doing so, as the specimen is in good condition and presents some good characters for its separation from *longispinosa* and its allies. (Compare *arcticum* Lundbeck)

7. *Agromyza flavonigra* Coquillett.

Plate XXX, Fig. 27.

Syn: *Agromyza flavonigra* Coquillett, Jour. N. Y. Ent. Soc., Vol. 10, 1902, p. 189.

Female: Head yellow, ocellar region and back of head brownish or blackish; frons distinctly, but not greatly, wider than one-third the head width; almost parallel-sided; the orbital bristles strong, black; antennæ rather small, yellow, third joint rounded in front, arista brown, yellow at base, almost bare, and falling just short of reaching to vertex; base distinctly swollen, elongate; cheeks broad, one-third higher posteriorly than anteriorly, and at former place one-half as high as eye-height; marginal bristles of moderate length, vibrissa not strong but distinctly longer than the other marginal bristles; proboscis and palpi yellow; palpi linear, with numerous short, black bristles. Mesonotum marked much as in *melampyga*, but the posterior quadrate excision in center has two linear, yellow, anterior prolongations which divide the black portion more or less distinctly into three vittæ; the posterior, longitudinal, yellow, dentiform incision of the outer lobe is also prolonged, and separates the outer portion of the posterior half of the black mark, so that it forms a separate black stripe giving the dorsum the appearance of having five vittæ. Four pairs of dorso-central bristles present, the anterior two pairs somewhat reduced in size. In other respects the thorax is much as in *melampyga*, but the fringe of the squamæ is pale and there is a lateral black spot at base on each side of scutellum. Abdomen yellow; first to fourth segments with a dorsal, brown, central spot, fifth with a pair of close placed spots on center of disk, sixth with a pair at near base which are wider placed than those on fourth, and another larger pair more widely placed at about middle; sixth segment about four times as long as fifth; base of ovipositor glossy black, conical, as long as sixth segment; all segments with numerous black hairs, those on apices of last two segments bristle-like. Legs yellow, brown on base of fore coxæ, bases and apices of all femora, as well as the entire tibiæ and tarsi of all legs. Wings much as in *melampyga*, but the inner cross vein is rather before the end of first vein, the second portion of fourth vein is shorter than first, the outer cross vein rather oblique, and the first section of fifth is shorter than in *melampyga*, being only two-thirds as long as last section. Length, 3 mm.

Locality—Beulah, New Mexico, (T. D. Cockerell). Re-described from type specimens. Food-plant unknown.

8. *Agromyza melampyga* Loew.

Plate XXX, Fig. 20; Plate XXXI, Fig. 31.

Syn: *Agromyza melampyga* Loew, Dipt. Amer. Sept. Indig. Cent. 8, 1869.*Agromyza sorosis* Williston, Trans. Ent. Soc. London, 1896, p. 429.*Agromyza flaviventris* Johnson, Can. Ent. Vol. 34, 1902, p. 242.

Male and Female: Head yellow, only black behind and on ocellar region; frons about one-third the width of head, almost parallel-sided, except at just anterior to vertex, where the eyes round off and the frons becomes rather abruptly wider; bristling normal; cheeks narrow, distinctly higher posteriorly, marginal bristles weak, anterior vibrissa incurved, of moderate size; antennæ rather below the average size, third joint rounded, arista brown, tapering, distinctly but shortly pubescent, slightly longer than the length of from its base to vertex; proboscis and palpi yellow. Thorax colored and marked as in *xanthophora*; four pairs of dorso-central bristles present; the anterior two pairs much reduced in size; other bristling as in that species; squamæ brownish from near base, the apex blackish, fringe brown. Abdomen varying from yellow to brown, with pale apices to segments; all segments with numerous black hairs. Legs generally entirely yellow, sometimes the tibiæ and tarsi are darkened somewhat; mid tibiæ with two yellow posterior bristles present. Wings clear, or slightly grayish; first costal division about one-half as long as second; second, third and fourth veins divergent on outer third; outer cross vein distinctly shorter than section of fourth vein anterior to it, or almost as long as it, first and second sections of fourth vein subequal, or the former slightly the shorter; penultimate section of fifth vein about three-fourths as long ultimate section. Halteres yellow.

Length, $1\frac{1}{2}$ -2 mm.

This species was originally described from District of Columbia, (Osten Sacken) by Loew. Coquillett records it (Bull. 10 in ser. U. S. Dept. Agric. 1898, p. 77) as bred from leaves of a cultivated species of *Philadelphicus*, collected at Washington, D. C. during the latter part of July, 1884, and from mines in leaves of *Plantago major*, collected June 28, 1888, same locality. He states that the larva pupated within the mines. These specimens are in collections at U. S. National Museum. Besides these specimens there is one from Biscayne Bay, Florida, (Mrs. A. T. Slosson) and I have examined a series reared from Plantain, June 26, 1912, Lafayette, Indiana, (J. J. Davis).

Johnson described *flaviventris* from Niagara Falls, New York. Williston's species was from St. Vincent, West Indies. Other localities: New Jersey (Smith); White Mountains, New Hampshire (Mrs. A. T. Slosson).

***Agromyza melampyga* var. *marginalis*, new variety.**

Male and Female: This variety differs from the type in being rather smaller $1\frac{1}{4}$ mm.; in being comparatively more strongly bristled, in having only the margins of the thoracic markings black, the remainder being yellowish, and in having the arista shorter, barely reaching to vertex in the only specimen in which it is extant.

The three specimens, two males, one female, were reared from *Paspalum*, (Oct. 2, 1912). Locality: Columbia, South Carolina, (P. Luginbill) Webster, No. 9711.

Type: Cat. No. 15561, U. S. N. M.

It is possible that this is a distinct species, but the material is too scanty to give one a basis for a definite opinion as to whether it is so, or whether the effect of a different food plant is responsible for the variation in color, etc.

9. *Agromyza brevicostalis*, new species.

Plate XXVIII, Fig. 8.

Female: Frons lemon yellow; one half as broad as head and distinctly broader than long; center stripe blackened on anterior half; orbits differentiated from center stripe; four orbital bristles present; in addition to the bristles there is a row of weak hairs nearer to eye margin, which begins at opposite base of antennæ and continues to beyond upper orbital bristle; ocellar region raised, brown; back of head, and a triangular patch at lateral angle of orbits brown, or black-brown; lunule yellow; antennæ of moderate size, black brown; second joint with distinct dorsal bristle; third joint rounded in front, covered with short pilosity; arista brown; basal swelling elongate; pubescence very indistinct; length of arista equal to from its base to upper orbital bristle; face yellow, blackened on depressions below antennæ; concave in profile; keel slight; cheeks yellow, blackened anteriorly; distinctly higher posteriorly than anteriorly; height at highest part less than one-half the height of eye; occiput not projecting on upper half; proboscis yellow; palpi black, normal. Mesonotum gray black, subopaque, broadly pale yellow on lateral margins; a small patch on each side posteriorly, the pale color extending slightly on to anterior lateral angle of scutellum; four pairs of dorso-centrals present, the anterior two pairs reduced in size; no distinct dorso-centrals anterior to suture, though the 3 setulæ immediately anterior to suture in line with dorso-centrals are rather strong; discal setulæ upright, not very numerous; about 4 irregular rows between the dorso-centrals; the pair of bristles between the posterior pair of dorso-centrals distinct, and of moderate length; humeri yellow, with a dark discal mark; pleuræ black-gray, subshining; sutures and upper margin narrowly, and a patch below wing base yellow; squamæ yellow, fringe brown. Abdomen glossy black, posterior margins of all segments narrowly pale yellow; segments with numerous hairs, stronger on posterior margins; base of ovipositor glossy black, as long as preceding segment. Legs black, glossy, knees

pale yellow, fore tibia and tarsi brownish; mid tibia without posterior bristles. Wings very similar to those of *parvicella*; subcostal vein incomplete; fourth vein not so indistinct as in *parvicella*.

Halteres yellow.

Length, 2 mm.

Type: Cat. No. 15562, U. S. N. M.

Locality: Glacier National Park, Montana, (Hopkins No. 5932c.), one female.

10. *Agromyza davisii* Walton.

Plate XXVIII, Fig. 7.

Syn: *Agromyza davisii* Walton, Ent. News Vol. 1912.

Female: Frons opaque, clear yellow, slightly broader than long, slightly more than one-third as wide as head, ocellar region shining black, orbits blackened posteriorly, back of head black; four pairs of orbital bristles present, the lower pair much the weakest; besides those bristles there is a row of short hairs, nearer to eye margin, almost on the whole length of orbit; antennæ above the average size, deep black, third joint subquadrate, covered with very fine short pilosity; arista gradually tapering, almost bare, as long as from its base to vertex; face brown, almost perpendicular, slightly keeled, mouth margin not produced, cheeks opaque, clear yellow, higher posteriorly than anteriorly, but at highest part only about one-fourth as high as eye-height; proboscis yellow; palpi black. Mesonotum opaque gray, four pairs of dorso-central bristles present, anterior pairs slightly weaker than the posterior two pairs; between the dorso-centrals there are on the anterior half of disk numerous setulæ which are irregularly arranged, but which represent at least four rows; anterior pair of dorso-centrals as widely placed as posterior pair; all bristles on margins very long; pleurae subshining gray black, the upper margin narrowly yellow, as well as a patch below wing base, and the suture behind middle coxæ; squamæ pale whitish yellow, fringe concolorous; scutellum concolorous with mesonotum, four marginal bristles present; postnotum shining black. Abdomen brownish black, apices of segments yellowish, ovipositor glossy black, distinctly longer than sixth segment; all abdominal segments with scattered hairs, which are strongest on the posterior margins. Legs black, knees narrowly yellowish; mid tibia without posterior bristles. Wings with costa to slightly beyond third vein, outer cross vein below one-fourth from end of first costal division, and at about one-half its own length from inner cross vein; discal cell shorter than lower basal cell; third and fourth veins regularly divergent on their last sections; fourth vein indistinct from outer cross vein; last section of fifth vein about two times as long as penultimate section.

Halteres yellow.

Length, 2.5 mm.

Type: Cat. No. 15563, U. S. N. M.

Locality: Lafayette, Ind. (J. J. Davis).

A single specimen of this species stood in the U. S. National Museum collection as *Napomyza lateralis* Fallen. Locality: Missouri, reared from *R. abortivus*.

Food-plant: *Ranunculus abortivus*.

11. *Agromyza abbreviata*, new species.

Plate XXXI, Fig. 32.

Male: Frons black; center stripe opaque, brownish in center; orbits glossy at base of bristles; five orbital bristles present, the bristles situated on near to inner margin of orbits; beyond them is an irregular row of hairs; ocellar region and ocellar triangle glossy, the latter rather distinctly defined for this group; antennæ as in *kincaidi*, but pubescence on arista much shorter; face subshining black, slightly concave in profile, the keel slight; cheeks opaque brown, rather long, distinctly higher at posterior margin than at anterior, at highest part a little more than one-fourth as high as eye; marginal bristles weak, in a double row, and rather numerous; the vibrissa weakly differentiated; eye comparatively larger than in *kincaidi* the occiput less projecting; proboscis yellow; palpi black, normal. Mesonotum shining black; the surface hairs numerous, and rather long; three distinct pairs of dorso-centrals present, the anterior pair reduced, and with a pair of large setulæ anterior to them; the pair of bristles between the posterior pair of dorso-centrals distinct, about half as large as the dorso-central pair; pleuræ glossy black, yellowish below wing base; squamæ yellowish white, fringe white; scutellum and postnotum glossy black. Abdomen concolorous with thorax; all segments with numerous surface hairs; hypopygium of normal size, glossy black. Legs piceous; knees yellowish, femora black; mid tibia with posterior bristles distinct. Wings clearer and comparatively broader than in *kincaidi*. Halteres yellow, knob white.

Length, 3.5 mm.

Type: Cat. No. 15564, U. S. N. M.

Locality: Las Vegas, Hot Springs, New Mexico, (H. S. Barber). One male.

12. *Agromyza kincaidi*, new species.

Plate XXIX, Fig. 12.

Female: Entirely black, except the halteres and squamæ, which are white, distinctly shining. Frons shining but not glossy, center stripe opaque, breadth of frons slightly more than one-half of the head width, slightly divergent posteriorly, orbital bristles on near inner margin of orbits, the upper one distinctly lower than anterior ocellus, the others close together and decreasing in size as they advance towards antennæ, besides the strong bristles there are smaller hairs arranged in a row nearer to eye margin on the entire length of orbit; frons in profile slightly projecting in front; face concave, with a slight central longitudinal keel, the upper mouth margin slightly protruding; cheeks brownish, posteriorly almost one-half as high as eye-height, anteriorly less than one-half as high as posterior height; mouth margin

with a double row of bristles, the upper of which are directed forward and slightly upward, and continue to lowest level of eyes anteriorly, vibrissa stronger than other bristles, incurved, situated lower than anterior bristles on ridge above; antennæ rather small, second joint with short bristles in addition to the dorsal one, and some on under side, third joint rounded except on dorsal surface at apex, where it is truncate; arista but little swollen at base, thickly but shortly pubescent, and shorter than from its base to anterior ocellus; proboscis brownish; palpi black, of moderate size, normal in shape, rather distinctly bristled. Mesonotum with three pairs of dorso-central bristles, and one or two long hairs anterior to the third pair; in addition to these the disk is covered with numerous short hairs. (The large pins used for transfixing the two specimens have practically destroyed the thorax and make it very nearly impossible to judge the nature of the chætotaxy, and it may be that in some cases the species has four instead of three pairs of dorso-centrals). Scutellum four bristled, disk bare; squamæ whitish, fringe pale. Abdomen glossy black, all segments with numerous hairs, those on apex of sixth segment bristle-like, base of ovipositor glossy black, longer than fifth segment. Legs entirely black, the mid tibiæ with the pair of posterior bristles present. Wings grayish, veins brown, costa carried indistinctly beyond third vein, but falling much short of fourth; inner cross vein at end of first vein, outer cross vein at slightly beyond center of wing, and at nearly twice its own length from inner cross vein; second section of fourth vein shorter than first, and rather more than one-fourth as long as last section; last section of fifth three-fifths as long as the preceding section.

Halteres white.

Length, 3 mm.

Type: Cat. No. 15565, U. S. N. M.

Locality: Juneau, Alaska, July 25, 1899, (Kincaid).

The paratype which is in rather poor condition differs slightly from the type in neuration, having the outer sections of the veins comparatively longer than in the type.

The species is named in honor of Prof. Trevor Kincaid, who collected it.

This is the species recorded by Coquillett as *A. neptis* Loew, (Proc. Wash. Acad. Sci. Vol. 2, 1900, p. 463), occurring in Alaska. It is very close to the species described by Schiner (Fauna Austriaca, Vol. 2, 1864, p. 303) as *nigripes* Meigen. He misidentified Meigen's species which has the costa to the fourth vein. Afterwards Rondani placed Schiner's species in *Domomyza* and retained the specific name as *nigripes* Schiner (nec Meigen). This generic division has been repudiated by various writers, and as no other valid name has been given to this species it must be renamed. (See Addenda.)

13. *Agromyza parvicella* Coquillett.

Plate XXVIII, Fig. 4; Plate XXX, Fig. 17.

Syn: *Agromyza parvicella* Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 189.

Female: Black, slightly shining; very slender species. Frons brown, yellowish in front, almost black at vertex, occupying more than one-half the width of the head; orbits distinct, darker than frontal stripe, each orbit rather more than one-half as wide as frontal stripe, the bristles, four on each side from anterior ocellus, situated near inner margin of orbit; the upper two stronger than the lower two, post-vertical bristles divergent; frons in profile slightly projecting, face slightly concave, mouth margin not projecting, face sub-shining, black; cheeks yellowish, more than one-half as high as eye, and of almost equal breadth on their entire length, marginal bristles weak, vibrissæ long, but not strong; antennæ black, second joint with the usual dorsal bristle, which is hair-like, otherwise entirely bare, third joint subquadrate, of moderate length, falling short of mouth margin, gently rounded at apex, arista thickened at base, very short, barely one and one-third times as long as antennæ, thickly, but very shortly pubescent; proboscis yellow at apex, membranous; palpi black, slightly projecting beyond upper mouth margin; occiput swollen from slightly below upper margin of vertex. Mesonotum subshining, four pairs of dorso-central bristles present, the pair anterior to the suture, and the anterior pair behind sutures slightly smaller than the posterior pairs; two irregular rows of setulæ between the dorso-centrals; pleuræ concolorous with disk of mesonotum, but glossy on lower portion; scutellum with four marginal bristles, disk bare; squamæ brownish, fringe long, brown. Abdomen concolorous with thorax; first segment elongated, about twice as long as second, remaining segments subequal; last abdominal segment glossy black; all segments with scattered, rather long hairs, those on apex of sixth segment longest. Legs long and slender, brown, trochanters, apices of femora and bases of tibia narrowly yellowish; no bristles present on mid tibiæ. Wings brownish, costa reaching only to end of third vein, second costal division two and one-half times as long as first; subcostal vein indistinct, obsolete on apical fifth; outer cross vein slightly before end of first vein, and at about its own length from inner cross vein, second section of fourth vein one-half as long as first; section of fifth vein between cross veins about one-fifth as long as last section; fourth vein indistinct, anal cell distinct, anal vein strong, reaching nearly to wing margin. Halteres yellow.

Length, 2 mm.

Locality: St. Paul Island, Alaska, (Kincaid).

Food-plant unknown.

Redescribed from type specimen in U. S. National Museum collection. This species is rather different from most species in *Agromyza* and may be considered by some writers as belonging to some of the other families in the Acalypterate Muscidæ, but I believe it may be most clearly associated with this genus. Like the next species it belongs to the segregate

of *Agromyza* with the costa to third vein only. This character is not of such importance that it may be considered as of generic value, and I therefore am not using Rondani's generic name *Domomyza*, as species which are very dissimilar are thrown together in *Domomyza*, and thus separated from forms to which they are more closely allied in *Agromyza*.

14. *Agromyza nitida*, new species.

Plate XXVIII, Fig. 1; Plate XXX, Fig. 26.

Female: Frons reddish yellow, distinctly longer than broad; ocellar region black; vertex and orbits posteriorly blackened; upper parts of frons shining, lower and central parts opaque; five pairs of moderately strong orbital bristles present, which are of almost uniform size and situated nearer to inner margin of orbits than to eyes; face slightly keeled, brown, in profile a little concave; antennæ brownish yellow, very short, second joint almost bare, the dorsal bristle weak, third joint longer than broad, twice as long as second, regularly rounded at apex; arista brown, slightly thickened at base, almost bare, not as long as half the length of from its base to vertex; cheeks yellow, lower margin narrowly shining black, in outline lower margin rounded, height posteriorly rather less than one-third that of the vertically elongate eye, anteriorly not so high; marginal bristles very weak, vibrissa present but not strong; proboscis yellowish brown; palpi concolorous, small, not dilated, bare. Thorax rounded above; mesonotum about one-third longer than broad, glossy black, covered on the disk with short setulose hairs, two pairs of rather widely placed, post-sutural, dorso-central bristles present, the pair of strong hairs between the posterior pair absent; humeri pale yellow, margins of mesonotum brownish; pleuræ brownish-black, glossy, upper margin narrowly yellow along suture; in front of wing base also yellowish; squamæ yellowish, the margin and fringe brown; scutellum rounded, concolorous with mesonotum, four marginal bristles present. Abdomen glossy black-brown, segments with an indication of a linear, yellow, posterior margin; ovipositor glossy black, barely longer than preceding segment; all abdominal segments with scattered hairs, those on the apical segment not much longer than the others. Wings grayish; auxiliary vein complete, but indistinct; second costal division about two and one-third times as long as first; outer cross vein situated directly below end of first vein and at its own length from inner cross vein, portion of fourth vein anterior to inner cross vein slightly more than twice as long as section beyond it; third and fourth veins regularly divergent on the whole of the last section, latter much less distinct than the longitudinal veins anterior to it; penultimate section of fifth vein one-third as long as ultimate section; costa reaching slightly beyond end of third vein. Halteres with yellow stalk and white knob.

Length, 1.5 mm.

Type: Cat. No. 15566, U. S. N. M.

Locality: Cabin John Bridge, Maryland, April 28, 1912, (Knab and Malloch). Food-plant unknown.

15. *Agromyza immaculata* Coquillett.

Plate XXVIII, Fig. 3.

Syn: *Odinia immaculata* Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 185.

Female: Frons yellow, or reddish yellow, almost parallel-sided, in breadth distinctly, but not greatly, more than one-third the head width; ocellar region black; orbits whitish; entire frons opaque; orbital bristles strong, only three pairs anterior to lower ocellus; the lower pair of which are incurved; face and cheeks pale yellow, the former almost perpendicular and with indistinct keel, the latter distinctly higher posteriorly than anteriorly, at middle less than one-third as high as eye height; marginal mouth bristles distinct, vibrissa not much longer than other bristles; antennæ yellow, brownish on upper and outer surfaces, dorsal bristle on second joint distinct, but no other noticeable bristles present; third joint of moderate size, more than twice as long as second, regularly rounded at apex, distinctly longer than broad; arista brown, with almost the basal third swollen, lanceolate, bare, in length as long as from its base to vertex; proboscis and palpi yellow, the latter with 2-3 weak hairs at apex. Mesonotum opaque gray, the space between the dorso-central bristles opaque, yellowish, with the appearance of pollinosity; four pairs of strong dorso-centrals present, which are in parallel rows, and but little weaker anteriorly, two rows of bristles between dorso-centrals, which are regular, equally spaced from dorso-centrals and from each other, and are not continued beyond middle of disk; besides the other normal bristles there are only 3-4 small setulæ laterally beyond the dorso-centrals; humeri yellow, with a black spot, lateral margins of mesonotum yellow; pleuræ yellow, a longitudinal, elongate spot on middle from propleuræ over mesopleuræ, a large triangular spot between fore and mid coxæ, a spot above hind coxæ, and a less distinct one below wing base; squamæ brownish, fringe brown; scutellum concolorous with disk of mesonotum, the yellow central stripe more distinct and, narrowly, much paler, with more the appearance of ground than surface color, in shape the scutellum is sub-triangular, flattened on surface; four marginal bristles present; post-notum anteriorly yellow, posteriorly shining black. Abdomen brownish with the posterior margins of basal four segments narrowly, and apex of sixth broadly yellow, or the sixth entirely yellow and the others broadly yellow at apices; ovipositor glossy brown, shorter than sixth segment; all segments with numerous hair-like bristles. Legs yellow, marked with brown on base of fore coxæ, upper surface and base of all femora; tibiæ and tarsi more or less brownish tinged; mid tibiæ without the posterior bristles. Wings grayish on anterior half; subcostal vein indistinct; first costal division one-third as long as second; outer cross vein distinctly beyond end of first vein, and at about twice its own length from inner cross vein, first division of fourth vein shorter than second, first section of fifth vein about three-fourths as long as last section; third and fourth veins subparallel, only distinctly divergent at extreme apices. Halteres pale yellow.

Length, 2 mm.

Type: Cat. No. 6649, U. S. N. M.

Type Locality: Mt. Washington, New Hampshire, (Mrs. A. T. Slosson).

Besides the type there are specimens in collection from the following locations: Two specimens, Santa Fe, New Mexico, (May), (H. S. Barber), one specimen St. Louis, Missouri, April 30, 1904 (W. V. Warner); and one specimen, Kaslo, British Columbia, July 17, 1903, (R. P. Currie).

Food-plant unknown.

The type specimen has the yellow thoracic markings on disk and scutellum rather indistinct, but in other respects is similar. It is a true *Agromyza* and has very little in common with *Odinia ornata* Zetterstedt, which is represented in the U. S. N. M. collection by one specimen from Dauphin county, Pennsylvania.

16. *Agromyza citreifrons*, new species.

Male and Female: Frons opaque, lemon yellow, distinctly longer than broad, one-half as wide as head, parallel-sided; orbits more or less blackened or browned, especially posteriorly; three pairs of long, fine, orbital bristles anterior to front ocellus, the upper distinctly in front of anterior ocellus, anterior to lower bristle there is a weak hair, otherwise the orbits are bare; ocellar region and back of head black; antennæ of moderate size, clear lemon yellow; second joint bare except for the weak dorsal bristle; third joint rounded, about three times as long as second; arista concolorous with antennæ on the swollen base, brown on remainder, almost bare, barely as long as from its base to anterior ocellus; face yellow, slightly retreating in profile; cheeks concolorous, higher posteriorly than anteriorly, at highest part over one-third the height of eye; eye slightly longer than high; marginal mouth bristles not numerous (4-5) but rather strong, the vibrissa hardly differentiated; proboscis and palpi clear lemon yellow. Mesonotum opaque, brown-black; lateral margins and humeri brownish yellow; four pairs of dorso-central bristles, arranged in parallel rows, anteriorly reduced in length; setulæ between dorso-centrals irregularly arranged in 3-4 rows, extending to posterior margin; pleuræ lemon yellow, a large brown or blackish triangular spot between the fore and mid coxæ, another smaller one over hind coxæ and an indistinct longitudinal mark sometimes present on mesopleuræ on middle; squamæ brownish, fringe brown; scutellum brown, with four marginal bristles; postnotum black. Abdomen shining brown, or blackish, lateral margins yellow in female, ovipositor of female glossy brown-black, as long as preceding segment of abdomen; hypopygium of male brownish, organs knob-like, of moderate size; all segments with numerous black hairs, which are noticeably longer on lateral margins and apices of last two segments. Legs yellow, tarsi browned; mid tibia without posterior bristles. Wings clear or slightly

browned; first costal division half as long as second, veins 2-3-4 regularly divergent on last sections, outer cross vein at beyond end of first vein, and at a little more than its own length from inner cross vein or at its own length from it, second section of fourth vein distinctly shorter than first; last section of fifth vein about twice as long as penultimate.

Halteres lemon yellow.

Length, 1-1.5 mm.

Type: Cat. No. 15567, U. S. N. M.

Type locality: Eureka, California, (H. S. Barber). Seven specimens. I have seen one specimen in C. W. Johnson's collection from Princeton, Maine, July 12, 1908.

Food-plant unknown.

17. *Agromyza pruinosa* Coquillett.

Syn: *Agromyza pruinosa* Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 189.

Male: Frons opaque, center stripe reddish, merging into brown on margins and posteriorly, orbits not distinctly differentiated, and, with outer margin of center stripe, blackish; breadth of frons one-half as wide as head; five orbital bristles present, the lower four pairs incurved, the upper one backwardly directed, no distinct orbital hairs present; vertical row and postvertical pair strong; lunule not differentiated from center stripe; face and cheeks reddish yellow, the former concave in profile, keel distinct, and brownish; eye orbits carried back over cheeks, blackish, cheeks and orbits at posterior angle of eye as high as eye, marginal bristles on mouth opening 4-5 in number, strong, upwardly directed, vibrissa hardly stronger, though distinct; proboscis and palpi reddish yellow. Mesonotum grayish black, opaque, elongate, about one-half longer than broad; four pairs of dorso-centrals present, about three irregular rows of setulae between the dorso-centrals; the pair of bristles between posterior pair of dorso-centrals distinct; pleurae subshining, black-brown, paler below wing base; squamae of moderate size, whitish, fringe brown. Abdomen subshining, brownish; hypopygium yellowish brown; of moderate size, all segments strongly haired. Legs strong; reddish yellow, bases of femora, apices of tibiae broadly, and entire tarsi brown; fore femora with distinct, rather long central bristles; mid tibia without any distinct posterior bristles. Wings slightly grayish; first costal division at least one-half as long as second, subcostal vein rather indistinct, complete; inner cross vein at very slightly before end of first vein, outer cross vein slightly outward bent at middle, at almost its own length from inner, and at very little beyond wing middle; veins 2-3-4 distinctly divergent on the outer section; second and third sections of fourth vein together half as long as last section; last two sections of fifth vein subequal. Halteres whitish yellow.

Length, 2.5 mm.

Redescribed from type (Cat. No. 6659, U. S. N. M.).

Locality: Colorado, (H. K. Morrison).

Food-plant unknown.

18. *Agromyza indecisa*, new species.

Female: Frons elongate, fully one and one-third times as long as broad, two-fifths as wide as head; orbits barely darker than central stripe; four equally strong orbital bristles anterior to front ocellus, the upper only slightly lower than anterior ocellus; besides these strong bristles there are several weak hairs situated nearer to eye margin opposite spaces between the bristles; antennæ reddish yellow, shaped and bristled as in *citrefrons*, arista entirely brown-black, distinctly swollen at base, almost bare, not reaching to anterior ocellus; face pale yellow, not produced at mouth margin, slightly keeled; cheeks distinctly higher posteriorly than anteriorly, at highest part one-third as high as eye; bristles much as in *citrefrons*; eye as high as long; proboscis and palpi yellow. Mesonotum black, subshining, disk slightly gray pollinose; lateral margins and humeri pale yellow; four pairs of dorso-central bristles present; anterior to the one in front of suture there is a small bristle which may be abnormal; other bristling as in *citrefrons*; pleuræ brown-black, shining; sutures yellow, squamæ brown; scutellum concolorous with disk of mesonotum, four bristled; postnotum shining black. Abdomen subopaque, brown-black; segments narrowly bordered posteriorly with yellow; ovipositor with base as long as sixth segment; bristles as in *citrefrons*. Legs yellowish brown; fore coxæ, with ventral surfaces and apices of femora yellow; posterior mid tibial bristles absent. Wings grayish; second costal division short of twice as long as first; subcostal vein rather distinct; outer cross vein beyond end of first vein, and at about its own length from inner cross vein; first section of fourth vein longer than second; last section of fifth twice as long as penultimate section. Halteres yellow.

Length, 1.5 mm.

Type: Cat. No. 15568, U. S. N. M.

Locality: Las Vegas, New Mexico, June, 1901, 11,000 feet level, (T. D. A. Cockerell).

Food-plant unknown.

19. *Agromyza varifrons* Coquillett.

Syn: *Agromyza varifrons* Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 189.

Female: Frons parallel-sided, subopaque, center stripe and orbits clear reddish yellow on lower half, blackened on upper half; orbits differentiated from center stripe, very narrow, each about one-fifth as wide as center stripe; four orbital bristles present, which are slightly reduced in strength from upper to lower bristle; no hairs on orbits besides the bristles; antennæ yellow, darkened on third joint at insertion of arista; second joint with dorsal bristle and weak apical hairs; third joint rounded in front, of moderate size, not longer than broad, covered with thick, but very short, white pilosity; arista brown, short, about one and one-third times as long as antenna, and as long as from its base to between upper two orbital bristles; pubescence very short but close; face and cheeks yellow, paler than frons, the latter gradually becoming higher towards

posterior margin, at posterior margin less than one-third the eye height, bristles on margin rather weak, vibrissa well differentiated; proboscis and palpi yellow. Mesonotum glossy black, humeri brownish; two pairs of dorso-central bristles present; disk with numerous short setulæ; pleuræ glossy black, brownish below wing base, squamæ grayish, margin and fringe brown; scutellum and postnotum concolorous with disk of mesonotum. Abdomen glossy black; base of ovipositor distinctly longer than preceding abdominal segment; posterior marginal bristles on last abdominal segment strong. Legs brown, apices of femora and bases of tibiæ paler, yellowish, mid tibia without distinctly differentiated posterior bristles. Wings clear, broad; first costal division almost one-half as long as second; inner cross vein beyond end of first vein, outer cross vein at below middle of wing, taking its upper end as below middle of costa, and at less than its own length from inner cross vein; second section of fourth vein less than one-half as long as first, first and second sections of this vein together half as long as last section; veins 2-3-4 divergent, fourth vein at below apex of wing; last two sections of fifth vein subequal. Halteres pale yellow. Length, 2 mm.

Redescribed from type. (Cat. No. 6658, U. S. N. M.).

Locality: Washington, District of Columbia, (collection Coquillett). A male in C. W. Johnson's collection from Pottstown, Pennsylvania, differs from the type in having the frons and antennæ paler lemon yellow, the arista slightly longer, and the cheeks distinctly over one-third the height of eye. In other respects similar to the female.

Food-plant unknown.

20. *Agromyza platyptera* Thomson.

Syn: *Agromyza platyptera* Thomson, Eugene Resa, 1851-1853, p. 608.

Agromyza coronata Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, p. 162.

Agromyza jucunda v. d. Wulp., Tijdschr. v. Entom. Vol. X, 1866, p. 161.

Oscinis malvæ Burgess, Dept. Agric. Rept. 1879, p. 202.

Agromyza lateralis Williston, Trans. Ent. Soc. Lond. 1896, p. 428.

Male and Female: Frons opaque, lemon yellow; orbits sometimes posteriorly blackened, four pairs of orbital bristles anterior to front ocellus; frons generally over one and one-half times as long as broad, and one-third of the head with; ocellar region and back of head black; face slightly concave in profile, yellow, slightly keeled in center; cheeks yellow, rather short, higher posteriorly than anteriorly, at highest part short of one-third the height of eye; eye higher than long; bristles on mouth margin moderately strong, numerous, upper ones upturned, vibrissa stronger than other bristles; proboscis yellow; palpi black, normal in shape; antennæ black; dorsal bristle on second joint weak, third joint short, regularly rounded, higher than long, arista brown-black, swollen at base, very shortly pubescent; not as long as from its base to vertex. Mesonotum shining black; lateral margins, including humeri, broadly pale yellow; two pairs of dorso-centrals present, some-

times a weaker anterior pair visible also; surface of disk with numerous irregularly arranged setulae; pleurae glossy black, with upper margin rather broadly and sutures narrowly yellow; scutellum and postnotum concolorous with disk of mesonotum, the former with four bristles. Abdomen shining, brownish-black, segments sometimes narrowly yellow on posterior margins; last segment elongate; all segments with black hairs. Legs glossy black, only in immature specimens paler on knees; mid tibiae with the posterior bristles indistinct. Wings clear; first costal division one-half as long as second; subcostal vein indistinct at apex; outer cross vein at very slightly beyond end of first vein, and at, or nearly at, its own length from inner cross vein, second section of fourth vein about as long as first vein or short of it; veins 2-3-4 divergent, last section of fifth vein about twice as long as penultimate section. Halteres yellow, knob paler.

Length, 2-3 mm.

Originally described from California. Loew's specimens (*coronata*) were from Cuba and Pennsylvania. Van der Wulp obtained his specimens (*jucunda*) from Wisconsin. Burgess described his specimens (*malva*) reared from *Malva rotundifolia* from District of Columbia; while Williston's specimens, (*lateralis*), came from St. Vincent, West Indies.

I have before me specimens from the following localities: Algonquin, Illinois, (collection Coquillett); Tempe, Arizona, (V. L. Wildermuth), Webster's No. 7286; White Mountains, New Hampshire, (Morrison ?); Los Angeles, California; (Coquillett); District of Columbia, from *Solidago*, (no collector's name); Cabin John, Maryland, (Knab and Malloch); San Rafael, Vera Cruz, (C. H. T. Townsend); Baracoa, Cuba, (Busck); Mayaguez, Porto Rico, (Busck); and 3 specimens without locality, one from aster, one from sunflowers and one from verbena.

One of the two specimens from Cabin John, Maryland (April 28, 1912) is much larger than the average, nearly 4 mm. and has the orbital bristles five in number, as well as the anterior hairs in line with the dorso-centrals much stronger than normal, so that there may be said to be four pairs of dorso-centrals. I consider, however, that it is merely an abnormal specimen and not a distinct species, because in almost every other respect it agrees with the typical specimens.

I have arrived at the decision as to the synonymy of this species from a careful perusal of the various descriptions, and consider that it is correct.

I have examined specimens from C. W. Johnson's collection from the following localities: Wollaston, Woods Holl,

Dedham, Auburndale, Fall River and Chester, Massachusetts; Durham, New Hampshire, Winnipauk, Connecticut; Kingston, Rhode Island, and Riverton, New Jersey, which agree well with the description given. Three specimens from same collection taken in the following localities: Chester and Blue Hills, Massachusetts, and Delaware Water Gap, Pennsylvania (Mrs. A. T. Slosson), differ in size, 3 mm., and in having an anteriorly bidentate, yellow spot, posteriorly on each side of disk, the pale color extending on to scutellum at base on each side. I consider that this is merely a color variety, due possibly to a difference in food-plant, or some other cause which could only be determined by rearing the species.

21. *Agromyza coquilletti*, new species.

Plate XXX, Fig. 28.

Male and Female: Frons lemon yellow, subshining, center stripe blackened, most distinctly on anterior margin where it meets the lunule, which is exceptionally elongated, the black color generally disappears on posterior part of center stripe; ocellar region black; orbits black on posterior angle, each orbit half as wide as center stripe at anterior ocellus, gradually broadened to anterior margins of center stripe where each orbit is almost of equal width with center stripe; four orbital bristles present, situated on middle of orbit, laterally beyond these there is a row of 5-7 short setulæ, which does not extend to upper orbital bristle; antennæ of moderate size, black, second joint brownish; third joint twice as long as second, upper margin flattened a little and apex rather acute, not regularly rounded; arista brown, thickened at base for about one-fourth the length of arista, nearly bare, and as long as from its base to anterior ocellus; face almost perpendicular, slightly produced at mouth margin, slightly keeled, yellow; cheeks yellow, posteriorly almost one-third the length of eye, anteriorly much less; marginal bristles of moderate size, vibrissa strong; proboscis yellow; palpi black. Mesonotum subshining, black, with grayish pollinosity; three pairs of distinct dorso-central bristles, the setulæ anterior to them stronger than the other discal hairs; lateral margins and humeri pale yellow; the pair of bristles between posterior dorso-centrals weak; pleuræ brown-black, shining, upper margin and central, vertical, suture narrowly yellow; squamæ and its fringe pale yellow; scutellum and postnotum black, shining; abdomen brown-black, shining; all segments narrowly margined with yellow posteriorly; hypopygium of male yellowish-brown; ovipositor of female glossy black, the base as long as last abdominal segment. Legs glossy black, knees distinctly pale yellow; posterior bristles absent from mid tibia; ventral bristles on fore femur rather long. Wings clear, basal part of veins lemon yellow; subcostal vein indistinct; outer cross vein a little before wing middle and well beyond end of first vein; second section of fourth vein longer

than first and twice as long as outer cross vein; third and fourth veins almost parallel from outer cross vein, only divergent at extreme apices; last section of fifth vein about one-fourth longer than penultimate section. Halteres yellow.

Length, 2 mm.

Type: Female. Cat. No. 15569, U. S. N. M.

Type locality: Fort Collins, Colorado, Webster's No. 6610, (C. N. Ainslie), bred from oats

Paratypes: Tower City, North Dakota, Webster's No. 3047, (G. I. Reeves), swept amongst grass; Fort Collins, Colorado, Webster's No. 6646, reared from *Hordeum jubatum*, July, 1910, (C. N. Ainslie); Buckton, Kansas, Webster's No. 5555; reared from volunteer wheat, June 11, 1909, (C. N. Ainslie); Hawkins, Summit County, Ohio (?), August 16, 1902 (no collector's name); Massachusetts (collection Coquillett). I have also examined specimens from C. W. Johnson's collection from the following localities: Fern Rock, Pennsylvania; Norwich, Vermont, Nantucket, Massachusetts and Hanover, New Hampshire.

This species is named in honor of the late D. W. Coquillett, whose work has done much to facilitate an understanding of the North American Diptera.

22. *Agromyza longipennis* Loew.

Syn: *Agromyza longipennis* Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 90.

Female: Frons pale lemon yellow, incision above lunule slightly darkened; orbits blackened posteriorly; ocellar region black; breadth of frons equal to over one-third the width of head, in outline the sides are almost parallel or a little divergent anteriorly; four pairs of long orbital bristles present, in addition to the bristles there is an irregular row of weak hairs nearer to eye margins, which begins at base of antennæ and extends to opposite the anterior ocellus; antennæ brownish yellow, darker dorsally, of moderate size; second joint with weak hairs on apical margin, and the usual dorsal bristle of moderate length; third joint rounded, covered with thick, but short, pilosity; arista brownish, swollen at base, very thickly pubescent, the pubescence as long as basal diameter of arista, arista as long as from its base to posterior ocelli; face and cheeks clear lemon yellow, the former slightly concave, and with slight keel; cheeks about twice as high at posterior as at anterior margin, at highest part slightly less than one-third the eye height; eye distinctly higher than long, marginal mouth bristles weak but numerous, vibrissa strong. Mesonotum subshining, black; four pairs of almost equally strong dorso-central bristles present; between which are 4-5 rather irregular rows of setulæ, no distinctly differentiated bristles between posterior dorso-centrals; lateral margins of mesonotum

sometimes brownish, pleuræ brown-black, subshining; upper margin, central vertical suture, and below base of wing narrowly yellow; scutellum concolorous with mesonotum, four bristled; postnotum brown-black, shining. Abdomen shining brownish or blackish; ovipositor glossy black, base slightly longer than last abdominal segment, covered with numerous short hairs. Legs brownish; fore coxæ, apices of all femora broadly, and bases of tibiæ yellow; the basal two pairs of former are generally almost black; posterior bristles absent from mid tibiæ. Wings elongate, clear or slightly grayish; first costal division one-third as long as second; inner cross vein at just below end of first vein or very slightly beyond it; outer cross vein distinctly shorter than section of fourth vein anterior to it, first and second sections of fourth vein subequal; last two sections of fifth vein subequal. Halteres pale yellow.

Length, 2.5 to 3 mm.

Originally described from District of Columbia (Osten Sacken).

Represented in collection by two specimens from Mount Washington and Franconia, New Hampshire, (Mrs. A. T. Slosson, collection Coquillett); and two from Algonquin, Ill., (collection Coquillett). Three of the specimens were standing as *A. xanthocephala* Zetterstedt, in collection. This identification may have been given out by Coquillett, though I cannot find any published record of the name. Zetterstedt's species differs from Loew's in having the legs entirely black. *Longipennis* comes very close *capitata* Zetterstedt as understood in Britain, but I have no specimens for comparison, and as Kertész gives *capitata* as a synonym of *geniculata*, which I have from Holland, and find distinct, I consider it advisable to continue the use of Loew's name, meantime.

Food-plant unknown.

23. *Agromyza coloradensis*, new species.

Male and Female: Frons opaque, ochreous yellow, about one-third longer than broad, sides almost parallel; orbits at lunule not one-half as wide as center stripe at same part; five pairs of orbital bristles present, the one nearest antennæ weakest; these bristles occupy middle of orbit and laterally beyond them is an irregular row of short hairs which extends from base of antennæ to fifth orbital bristle; sides of orbits and back of head blackened; ocellar region shining black; antennæ black; basal joint and apex of second on inner surface yellow; second joint with numerous short hairs on dorsal and ventral surfaces, the dorsal bristle distinct; third joint of moderate size, slightly longer than high, regularly rounded on the upper margin or apex obtusely angled; arista black, slightly thickened at base, the pubescence thick but very short, arista in length reaching to front ocellus; face and cheeks pale yellow, the former concave and very slightly keeled in center; cheeks higher pos-

teriorly than anteriorly, at highest part about one-third as high as eye, marginal bristles distinct, 6-7, the anterior pair higher than vibrissa; vibrissa strong; proboscis yellow; palpi black, distinctly bristled. Mesonotum subopaque, gray-black, about one-third longer than broad; lateral margins with indications of brownish color, but not yellow; four pairs of long dorso-central bristles present, which are in parallel rows, the anterior pair distinctly in front of suture; four irregular rows of setulae between the dorso-centrals, which are carried to between posterior pair; no distinctly differentiated bristles between posterior dorso-centrals; pleurae marked as in *longipennis*; squamae yellow, fringe brownish; postnotum and scutellum concolorous with disk of mesonotum. Abdomen elongate, shining black, with grayish pollinosity, only the last segment with distinct, very narrow, yellow posterior margins; ovipositor glossy black, base as long as last abdominal segment, segments with numerous short hairs; hypopygium of male rounded, with two flap-like protruding, downward directed, apical organs. Legs black, shining, knees distinctly, but narrowly, pale yellow; mid tibiae without posterior bristles. Wings grayish, rather elongate, venation almost as in *longipennis*. Halteres yellow.

Length, 3.5 to 4 mm.

Type: (Male); Cat. No. 15570, U. S. N. M.

Locality: Florissant, Colorado, (7,000 feet level) June 21, 1907, (S. A. Rohwer). Five specimens, two males and three females. Taken amongst grass. There is a female from Colorado in C. W. Johnson's collection and a male in same collection from Eastport Maine.

Food-plant unknown.

24. *Agromyza marginata* Loew.

Syn: *Agromyza marginata* Loew, Dipt. Amer. Sept. Indig. Cent. 8, 1869, species 91.

Male and Female: Frons pale lemon yellow, shining, center stripe opaque black, deepest in color at anterior margin above lunule; ocellar triangle distinct, black, margins narrowly yellow; orbits of nearly equal breadth on their entire length, darkened anteriorly, four orbital bristles anterior to front ocellus, these are on middle of orbits, there are no additional hairs present on any of the specimens before me; antennae brown, of rather less than normal size, dorsal bristles on second joint of moderate size; third joint rounded, barely longer than broad; arista brown, slightly swollen and tapering at base, almost bare, reaching from its base to anterior ocellus in female, slightly shorter in male; face brown, concave in profile, the lower margin, at mouth, projecting slightly, center keel indistinct; cheeks yellowish brown, short, gradually deepening from front to back, where they are less than one-fourth the height of the eye; marginal bristles distinct, vibrissa strong; eye distinctly higher than long. Mesonotum slightly longer than broad, glossy black brown; three pairs of dorso-centrals present, the anterior pair weak, disk with numerous distinct

setulæ; lateral margins and humeri brown; pleuræ glossy brown-black; upper margin and central, vertical, suture narrowly, and a patch below wing base yellow; scutellum distinctly broader than long, concolorous with disk of mesonotum; postnotum concolorous with pleuræ; squamæ yellow, margin and fringe brown. Abdomen glossy brown, or black-brown, posterior margin of last segment sometimes narrowly yellowish; last abdominal segment almost as long as the three preceding segments, ovipositor elongate, glossy black; male hypopygium knob-like, of moderate size, about one-fourth as long as preceding abdominal segment; surface hairs most numerous on the sides of second segment, and longest on apical segments. Legs yellow; basal half of each femur brown-black, apices of tibiæ and all tarsi more or less browned; posterior mid tibial bristles absent. Wings grayish; first costal division one-third as long as second, subcostal vein indistinct, but complete, inner cross vein at just below end of first vein, outer cross vein at distinctly more than its own length from inner and at wing middle; first and second sections of fourth vein subequal; penultimate section of fifth vein slightly shorter than ultimate; outer half of last sections of veins 3-4 almost parallel. Halteres clear yellow.

Length, 1.5 mm.

Originally described from District of Columbia (Osten Sacken).

Represented in collection by three specimens, two females and one male, from Beverly, Massachusetts (Burgess). These specimens bear the dates May 28, 1868; August 28, 1869; and May 24, 1874, respectively.

Food-plant unknown.

25. *Agromyza canadensis*, new species.

Plate XXX, Fig. 19.

Female: Frons opaque, brown, sides subparallel, in breadth one-third the width of head and distinctly longer than broad, orbits slightly differentiated, subshining; orbital bristles five in number, situated near to inner margin of orbits, decreasing in size from back to front; no hairs on orbits in addition to bristles; ocellar region shining, the anterior ocellus separated more widely from posterior ocelli than posterior ocelli from each other; antennæ yellowish-red, third joint brown; second joint with strong dorsal bristle, and weaker apical hairs; third joint rather elongate, one-third longer than broad, rounded at tip; arista brown, yellow, and with an elongate swelling at base, pubescence very weak, distinctly shorter than basal diameter of arista, length of arista as long as from its base to between upper two orbital bristles; face in profile perpendicular, yellow, with whitish dusting and distinct keel, a blackish line on each side of keel, cheeks linear, only slightly higher at posterior margin than anteriorly, brown, paler on margins; marginal bristles upturned, of moderate strength; vibrissa strong; the weak bristles are continued upward beyond the level of vibrissa; proboscis yellow; palpi brown, slightly spatulate, with distinct bristles.

Mesonotum shining, brown-black on disk, with gray dusting, humeri and lateral margins reddish yellow; five pairs of dorso-central bristles present, the anterior three pairs reduced in size, only the front pair anterior to suture; the pair of bristles between the posterior dorso-centrals very strong; disk with numerous setulose hairs; pleurae brown, shining, sutures and below wing base yellowish; squamae whitish yellow, fringe concolorous; scutellum and postnotum concolorous with disk of mesonotum. Abdomen reddish yellow; last segment not elongated; base of ovipositor glossy black, slightly longer than preceding abdominal segment; all segments with numerous black bristle-like hairs. Legs yellow, stout; posterior side of mid tibia with two bristles. Wings slightly grayish; costa thickened at end of first vein, first costal division (to near side of first vein) less than one-half as long as next division (from end of swollen junction of first vein with costa); upper end of outer cross vein below a point in costa beyond middle of wing; veins 2-3 distinctly, 3-4 hardly divergent; section of fourth vein beyond inner cross vein one and one-half times as long as outer cross vein, and distinctly longer than preceding section of fourth; inner cross vein below junction of first vein with costa; last section of fifth vein three-fifths as long as penultimate section; basal part of wing veins clear yellow. Halteres yellow, knob whitish.

Length 3 mm.

Type: Cat. No. 15571, U. S. N. M.

Locality: Cottage Beaulieu, Ottawa, Canada, August 14, 1906, (Germain Beaulieu), one female.

Food-plant unknown.

26. *Agromyza laterella* Zetterstedt.

Syn: *Agromyza laterella* Zetterstedt, Ins. Lappon, 1838, p. 788, species 7.

Agromyza grossicornis Zetterstedt; Dipt. Scand. Vol. XIV, 1860, p. 6456.

Agromyza magnicornis Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 86.

Male and Female: Frons about one-half as broad as head, center stripe opaque, brownish or blackish, with slight whitish dusting, orbits shining, four or five orbital bristles anterior to front ocellus, beyond these, laterally, is an irregular row of hairs; frontal lunule whitish dusted, very distinct; ocellar region shining black; antennae black; in male large, third joint very variable both in size and shape, either subquadrate, elongated and truncate at apex, or enlarged and rounded at apex, very thickly covered with distinct, pale pilosity; in female the third antennal joint is much smaller and rounded; arista black, inserted near base of third joint, thickened on basal third, pubescence very short and indistinct, length of arista equal to from its base to second uppermost orbital bristle; head of male slightly produced in front, the frons slightly buccate; face concave; cheeks short, distinctly higher posteriorly than anteriorly, but at highest part not one-fourth as high as eye, marginal bristles distinct; vibrissa well differentiated; proboscis yellow; palpi black, normal; occiput unprojecting on upper half. Mesonotum black, slightly shining, indistinctly gray dusted, lateral margins

brownish yellow; four pairs of dorso-centrals present; discal setulae rather strong; the pair of bristles between the posterior pair of dorso-centrals distinct, but not large; pleurae glossy black, narrowly lemon yellow along upper and medium vertical suture, and broadly below wing base; squamae almost white, fringe concolorous; scutellum and postnotum gray black. Abdomen glossy black, or black-brown, posterior margins of segments generally narrowly yellow, sometimes the base of abdomen yellow laterally; hypopygium of male small; ovipositor of female glossy black on basal portion. Legs black, or black-brown, knees distinctly pale yellow; mid tibia without distinct bristles on posterior surface, except in one specimen. Wings clear, basal part of thick veins pale yellow; subcostal vein indistinct, but complete; second costal division about $2\frac{1}{2}$ times as long as first; inner cross vein at just before end of first vein, and at about middle of discal cell; last cell section of fifth vein subequal with penultimate section; veins 3-4 slightly divergent on their last sections. Halteres yellow.

Length 1.5-2.5 mm.

Localities of specimens examined: Algonquin, Illinois, (collection Coquillett); Franconia, New Hampshire, (Mrs. A. T. Slosson); Biscayne Bay, Florida, (Mrs. A. T. Slosson); Rosslyn, Virginia, October, 1903, (E. S. G. Titus); Beverly, Massachusetts, June 1, 1868, (Burgess); another same collector and locality, June 2, 1876; Worcester, Mass., "Gall on Iris" (no collector's name); and South Fork, British Columbia, (R. P. Currie). There are specimens in C. W. Johnson's collection from Chester and Framingham, Massachusetts.

This species has been recorded by Thomson,* as feeding galls on blue Iris, and although there is no collector's name on the Worcester specimen mentioned above, it is very probably belongs to the lot reared by him, as Coquillett identified specimens.

This is a very variable species in color, and structure of the antennae, and one might be easily led into considering some of the forms as distinct species. I am, however, convinced from my acquaintance with the species in Britain, that there is but one species, though it probably feeds upon different food plants, as I have met with it in situations where it could not have fed upon Iris.

*Psyche, Vol. XIV, 1907, p. 74.

27. *Agromyza maculosa*, new species.

Male and Female: Shining black, frontal lunule silvery white pollinose; legs with tibiae and tarsi sometimes brownish; halteres white with black spot.

Frons very slightly more than one-third the head width; center stripe opaque; orbits glossy, differentiated from center stripe; five (and occasionally six), strong orbital bristles present; frontal lunule distinct, viewed from above and behind shining silvery white; antennae with second joint brownish, dorsal bristle distinct; third joint of moderate size, rounded at apex, covered with very short, brownish pubescence; arista brown, distinctly swollen and tapering at base, pubescence short and close; length of arista equal to from its base to between upper two orbital bristles anterior to ocelli; face shining in center, subopaque on sides, in profile concave; the central keel rounded, not sharp, cheeks rather short, twice as high posteriorly as anteriorly, marginal bristles rather strong though short, slightly upcurved and continued weakly beyond vibrissa; vibrissa strong, well differentiated; proboscis brownish yellow; palpi black, of normal size and shape. Mesonotum with four pairs of strong dorso-centrals which are slightly reduced in size from posterior to anterior pairs; five or six rather irregular rows of setulae between the dorso-centrals, the pair of bristles between the posterior dorso-centrals slightly differentiated from the discal setulae; pleurae below wing base slightly yellowish; squamae of rather large size, white, fringe concolorous. Abdomen rather broad, ovate; all segments with short dorsal hairs, stronger on margins laterally and posteriorly, noticeably longer on posterior margins of last two segments; base of ovipositor barely longer than preceding segment. Legs strong, front femur with distinct ventral bristles; mid tibia with the posterior two bristles distinct. Wings with base slightly yellowish; first vein yellowish to end; subcostal vein weak; first costal division one-half as long as second; inner cross vein at below end of first vein; outer cross vein at slightly beyond middle of wing, and at its own length, or slightly more, from inner cross vein; last section of fifth vein distinctly, but not greatly shorter than penultimate section; veins 2 and 3 distinctly, 3 and 4 slightly divergent. Halteres white, outer surface of knob and most of stalk blackened.

Length, 3-4 mm.

Type: Cat. No. 15641, U. S. N. M.

Type locality: Jamaica, New York, October, 1896. Bred from chrysanthemum leaves. Paratypes from Louisville, Ky., October 27, 1898; 6 specimens bred from chrysanthemum leaves No. 4064; Lafayette, Ind., October 11, 1901, (H. B. Dorner), 5 specimens bred from leaves of aster; Jamaica, New York, 2 specimens from same lot as type; and one specimen without data from Georgia. One specimen in C. W. Johnson's collection from Bermuda, West Indies.

28. *Agromyza waltoni*, new species.

Plate XXVIII, Fig. 6; Plate XXXI, Fig. 36.

Female: Frons black, center stripe opaque, orbits subshining, glossy at base of bristles; breadth of frons slightly more than one-half the head width, and almost subquadrate; orbits slightly differentiated from center stripe, each at broadest part about one-fourth the breadth of center stripe at same part, orbital bristles five in number, on one side at margin of lunule is another smaller bristle which I take to be abnormal; lunule brownish yellow, covered with white pollinosity; ocellar region subopaque; posterior ocelli occupying about one-fifth the width of vertex; antennæ black, rather below average size; second joint with apical bristles on outer side, the dorsal bristle distinct; third joint rounded, barely longer than broad, not distinctly pilose; arista black, paler at base, swollen on basal fourth, almost bare, in length reaching almost from its base to upper orbital bristle; face and cheeks black-brown; slightly gray dusted; the former in profile almost perpendicular, center raised slightly, but not sharply keeled; cheeks at posterior margin about one-sixth the eye height, anteriorly becoming linear; marginal bristles strong, anterior two higher than vibrissa; vibrissa strong; proboscis yellow; palpi black, slightly spatulate, bristles weak. Mesonotum black, slightly shining, grayish dusted; four pairs of dorso-centrals present, these are reduced in size anteriorly; the setulæ between the dorso-centrals in about 10 irregular rows, the two bristles between posterior dorso-centrals distinct, separated from each other by almost twice the distance between them and the dorso-centrals; pleuræ black, shining, sutures brownish; squamæ brownish yellow, fringe brown; scutellum and postnotum concolorous with pleuræ. Abdomen shining black. Sixth segment elongated; base of ovipositor shorter than preceding segment; all segments with numerous hairs, those on apices of segments, and especially the sixth, bristle like. Legs black, shining; knees brownish; fore femur with long ventral bristles; the posterior bristles on mid tibia present, but very short in type. Wings yellowish brown at base; subcostal vein complete, rather distinct; second costal division slightly more than twice as long as first; inner cross vein slightly beyond end of first vein, outer at length of inner from that vein, and distinctly before wing middle, veins 2-3-4 very noticeably divergent at apices; penultimate section of fifth distinctly shorter than ultimate section. Halteres yellow, knobs whitish.

Length, 4 mm.

Type: Cat. No. 15572, U. S. N. M.

Locality: Long Lake, Adirondack Mountains, (Horvath).
One female.

Food-plant unknown.

Named in honor of Mr. W. R. Walton of the Bureau of Entomology.

29. *Agromyza angulata* Loew.

Plate XXIX, Fig. 16; Plate XXX, Fig. 18.

Syn: *Agromyza angulata* Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 87.

Male and Female: Frons deep black, with sometimes a slight indication of paler color very narrowly along the inner margin of orbits; central stripe opaque, orbits shining; breadth of frons distinctly over one-third the head width, of orbits about one-half the width of center stripe; generally 5 orbital bristles present; in addition to the bristles there are numerous short hairs nearer to eye margin, forming an irregular row from opposite insertion of antenna to upper bristle; ocellar region glossy black; antennæ black, of moderate size; dorsal bristle on second joint distinct; third joint rounded at apex; arista brown, basal fifth yellowish and swollen, pubescence very short, length of arista equal to from its base to between upper two orbital bristles; face and cheeks black, or black brown, opaque; the former with a slight central keel, and a little produced at mouth margin; cheeks almost linear, very little higher at posterior margin than at anterior; marginal bristles in a double row, of moderate strength; vibrissa well differentiated; proboscis yellow; palpi black, of normal size and shape. Mesonotum glossy black, lateral margins sometimes brownish; four pairs of dorso-centrals present, the posterior pair strong, the others gradually reduced towards anterior pair, which are rather weak and slightly in front of suture; 7-8 irregular rows of short setulæ between dorso-centrals; no distinctly differentiated pair of bristles between posterior dorso-centrals; pleuræ glossy black, very narrowly lemon yellow along upper margin to humerus, narrowly along vertical mesopleural suture, more broadly at upper angles of that suture and below wing base; postnotum and scutellum colored as disk of mesonotum, squamæ whitish yellow, fringe whitish. Abdomen ovate, glossy black, sometimes with the segments very narrowly pale yellow, or brownish; sixth segment elongated; all segments with numerous surface hairs; apical margin of sixth segment with moderately long bristles; hypopygium of male of moderate size, colored as abdomen, base of ovipositor of female glossy black. Legs black, shining; fore knees pale yellow, knees of hind pairs, fore tibiæ and tarsi brownish, or yellowish; mid tibia without posterior bristles. Wings clear; bases of thick veins lemon yellow; first costal division one-half as long as second; outer cross vein below, or slightly beyond end of first vein; subcostal vein indistinct; first two sections of fourth vein subequal, or the first slightly the shorter; last section of fifth twice as long as penultimate section; veins 2-3-4 slightly divergent. Halteres pale yellow.

Length 1.5-2 mm.

Originally described from Pennsylvania (Osten Sacken), and since recorded from New Jersey, (Smith Cat.). Represented in U. S. National Museum collection by four specimens from

Lafayette, Indiana, (P. Luginbill) Webster's No. 9700, reared from timothy grass, and two specimens with the No. 6719, July 13, 1895, District of Columbia. There is one specimen in C. W. Johnson's collection from Auburndale, Massachusetts.

30. *Agromyza setosa* Loew.

Syn: *Agromyza setosa* Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 83.

Male and Female: Frons black or black-brown; center stripe opaque; orbits shining; width of frons equal to slightly over one-third the width of head; orbits about one-half as wide as center stripe; five orbital bristles present, situated nearer to inner than outer margin of orbits; in addition to the bristles there are numerous short hairs present, between the eye margins and the bristles, which are particularly numerous on the lower half of orbit and terminate in an irregular row at about level of upper orbital bristle; ocellar region shining; ocellar triangle slightly indicated, shining; antennæ black, moderately large; second joint slightly over the average size, with numerous hairs, the usual bristle distinct; third joint rounded at apex, barely longer than broad, covered with short brownish pilosity; arista brown, for a short space paler beyond the distinctly thickened base; pubescence short but distinct, very close; length of arista equal to from its base to the second uppermost orbital bristle; face and cheeks black-brown; the former perpendicular and with a rounded central keel; cheeks increasing in height from anterior to posterior margin, where they are about one-fourth the height of eye; marginal bristles of moderate length, in two rows, and rather numerous, the upper row upwardly directed; vibrissa differentiated; probocis brown; palpi black, of moderate size, rather numerously bristled; eyes microscopically haired. Mesonotum subshining black; thickly covered with hairs and with four pairs of dorso-central bristles, the anterior pairs much reduced and the front pair not much stronger than the other dorsal hairs; the pair of bristles between the posterior dorso-centrals distinct, and of moderate length; pleuræ concolorous with disk of mesonotum, only brownish below wing base; squamæ brown, fringe concolorous; postnotum and scutellum colored as pleuræ. Abdomen concolorous with thorax; the surface rather thickly covered with hairs; sixth segment with some bristle-like hairs on posterior margin; hypopygium of male almost similar to that of *parvicornis*; ovipositor of female with base thickly covered with hairs. Legs black, tibiæ and tarsi black brown; posterior bristles on mid tibiæ very weak. Wings grayish, veins brown; first costal division nearly one-half as long as second; subcostal vein indistinct, almost coalescent with first at its apex; costa thickened at end of first vein; inner cross vein at slightly beyond end of first vein or at just below it; outer cross vein at slightly beyond wing middle, and at slightly more than its own length from inner cross vein; last section of fifth vein about one-half as long as penultimate section; veins 3-4 only slightly divergent at apices. Halteres yellow, stalk darkened at base.

Length 3-4 mm.

Originally described from District of Columbia (Osten Sacken). Represented in U. S. National Museum collection by 3 specimens, one from Monroe, Michigan, no other data; one with the number 2464—, and the third with label to the effect that it was reared from wild rice (*Zizania aquatica*) August 8, 1891, District of Columbia, (T. Pergande). The other records given by Coquillett for this species in Bull. No. 10, n. ser. 1898, Dept Agric., Div. Ent. refer to *fragaria* and *maculosa*.

There is a male specimen in the U. S. National Museum collection which represents probably a distinct species, but its condition is not good enough to permit me deciding the question, as the species of the group are all very closely allied.

Locality: San Mateo County, California (C. F. Baker).

31. *Agromyza isolata*, new species.

Female: Frons black-brown; center stripe opaque, orbits shining; breadth of frons a little over one-third the width of head; orbits slightly differentiated from center stripe, and each about one-fourth as wide; four long orbital bristles present, situated about on middle of orbits; the short hairs sparse and in a short irregular row; ocellar region raised, shining; ocellar triangle not distinguishable; antennae black-brown; second joint with numerous short, apical marginal hairs, and the dorsal bristle distinct, third joint slightly longer than broad; the upper extremity less distinctly rounded than the lower, covered with rather distinctive pile, which is brownish in color, and most distinct on dorsal surface at apex; arista brown, the swelling at base short and glossy; pubescence very short; length of arista equal to from its base to upper orbital bristle; face brown-black, perpendicular, almost without a central keel; cheeks nearly linear, brown-black; marginal bristles in two rows of moderate strength; vibrissa distinctly differentiated, the bristles continued above level of vibrissa; eye apparently bare, about one and one-half times as high as long; proboscis yellow; palpi black. Mesonotum black, shining, but not glossy; four pairs of distinct dorso-centrals present, the posterior pair most widely placed and strongest, the anterior pair of moderate strength, distinctly longer than discal setulæ, and appreciably in front of suture; about 7 irregular rows of setulæ between the rows of dorso-centrals; the pair of bristles between the posterior dorso-centrals as long as anterior dorso-central pair; pleuræ black-brown, glossy, narrowly paler along upper margin and sutures, yellowish beneath wing base; squamæ yellowish white, margin and fringe brown; postnotum and scutellum concolorous with disk of mesonotum. Abdomen ovate in shape, glossy black, apical segment yellowish brown at apex, base of ovipositor longer than preceding segment; hairs on ovipositor yellowish, on abdomen and thorax brownish. Legs yellowish brown, the femora blackened; all legs with num-

erous hairs, which are yellowish in color; mid tibia with the posterior bristles small. Wings clear; second costal division about two and one-half times as long as first; subcostal vein distinct, evidently coalescent with first at apical fourth; inner cross vein at slightly before end of first vein; outer at slightly beyond wing middle, and at one and one-half times its own length from inner; veins 3-4 slightly divergent at apices; last section of fifth vein rather over two-thirds as long as the penultimate section. Halteres yellow, knob whitish.

Length 2 mm.

Type: Cat. No. 15573, U. S. N. M.

Locality: Eureka California, May, (H. S. Barber).

Food-plant unknown.

32. *Agromyza fragariæ*, new species.

Plate XXVIII, Fig. 5.

Male and Female: Frons dark brown, or black brown; center stripe opaque; orbits subopaque; breadth of frons distinctly over one-third the width of head; orbit one-fourth as broad as center stripe; four orbital bristles present, the hairs on orbits not numerous; ocellar region shining, black, raised, frontal triangle not distinguishable; antennæ black, sometimes with indications of paler color at apex of second joint on inner surface; rather below the average in size; second joint with weak apical hairs, and the dorsal bristle distinct, third joint not longer than broad, rounded in front, and covered with short brownish pile; arista brown, thickened on basal fourth, the pubescence close, but very short; length of arista equal to from its base to slightly beyond second uppermost orbital bristle; face shining black, perpendicular, keel very slight; cheeks pale brown, linear at anterior margin, about one-third as high as eye at posterior margin; marginal bristles in a double row, numerous, of moderate length, extending above level of vibrissa, which is distinctly differentiated; proboscis yellow; palpi black. Mesonotum subopaque, black, with slight indications of grayish dusting; four pairs of dorso-centrals present, which become shorter towards front, the anterior pair slightly in front of suture; 6-7 irregular rows of setulæ between the dorso-centrals; the pair of bristles between the posterior pair of dorso-centrals distinctly differentiated from the discal setulæ, about as long as anterior pair of dorso-centrals; pleuræ shining black-brown, the suture yellowish brown; squamæ whitish, fringe brownish-yellow; postnotum and scutellum black, subshining. abdomen shining black, subovate in female, elongate in male; covered with hairs, those on posterior margins of segments bristle-like; the dorsal hairs on abdomen and mesonotum are brownish yellow. Legs rather slender, black-brown, tibiæ and tarsi paler; posterior mid tibial bristles minute. Wings elongate, grayish; first costal division one-third as long as second; subcostal vein rather distinct, almost coalescent with first at its apex; inner cross vein at slightly before end of first vein, and at middle of discal cell; outer cross vein at about one and one-half

times its own length from inner and at wing middle; last section of fifth vein about two-thirds as long as penultimate section; veins 3-4 gradually and slightly divergent. Halteres yellow.

Length 1.5-2 mm.

Type: Cat. No. 15574, U. S. N. M.

Locality: Placer County, California, November, mining leaves of strawberry, (A Koebele).

Three specimens.

33. *Agromyza posticata* Meigen.

Plate XXXI, Fig. 29.

Syn: *Agromyza posticata* Meigen, Syst. Besch., Vol. VI, 1830, p. 172, species 16.

Agromyza terminalis Coquillett, Proc. Acad. Nat. Sci. Phil. 1895, p. 318.

Agromyza taeniola Coquillett, Proc. Ent. Soc. Wash., Vol. VI, 1904, p. 191.

Male and Female: Frons black, center stripe opaque, orbits shining, breadth of frons less than one-third the head width; four orbital bristles below anterior ocellus, small hairs on orbits microscopic in male, strongest in female; lunule silvery white pollinose; antennæ brown, of normal size; dorsal bristle on second joint distinct, apex of same joint with numerous short hairs, which are most distinct on the under side; third joint rounded, covered with short, pale pilosity; arista brown, pale yellowish on basal elongate swelling, very thickly covered with short pubescence, which is not longer than the basal diameter of arista; arista as long as from its base to beyond upper orbital bristle; eyes microscopically haired, cheeks and face brown; the latter concave in profile, keel slight; cheeks linear at anterior margin, at posterior margin very slightly broadened, marginal bristles, 5-7, of moderate strength; vibrissa strong; proboscis yellow; palpi brownish yellow, normal in size, with weak end bristles. Mesonotum glossy brownish-black, margins and humeri pale brown, with an indication of yellow along suture between margin of disk and pleuræ; three distinct pairs of dorso-centrals present, in one specimen an additional bristle is visible on one side anterior to the front pair; 5-6 irregular rows of setulæ between dorso-centrals, the pair of bristles between posterior dorso-centrals distinctly differentiated from setulæ but much weaker than dorso-centrals; pleuræ glossy brown, yellowish along suture and below wing base; scutellum and postnotum concolorous with disk of mesonotum; squamæ whitish, fringe white. Abdomen glossy black-brown; apical three segments and hypopygium of male pale yellow, of female posterior margin of sixth segment distinctly pale yellow; apical segments brownish, ovipositor glossy black; last abdominal segment in male slightly elongated; all segments with numerous short black hairs, the apical segments with unusually weak posterior marginal bristles. Legs brown-black, glossy, knee joints paler; mid-tibia with posterior bristles present, in some cases those number three, instead of the normal two. Wings yellow at base; first costal division almost one half as long as second; inner cross-vein at below, or slightly beyond, end of first vein; subcostal vein indistinct, but complete;

outer cross vein at slightly beyond wing middle, and at rather more than its own length from inner cross vein; last section of fifth vein about two-thirds as long as penultimate section; veins 2 and 3 distinctly, 3 and 4 slightly divergent at apices. Halteres yellow, knob whitish.

Length 3-4 mm.

Localities of male specimens in collection: Delaware county, Pennsylvania, July 23, 1893 (collection Coquillett), the type of *terminalis* Coquillett; Franconia, New Hampshire, (Mrs. A. T. Slosson); White Mountains, New Hampshire (Morrison); District of Columbia, June (collection Coquillett); Oswego, New York, July 7, 1897; and Athens, Tennessee, August, (H. S. Barber).

The female has the apical abdominal segments so much less distinctly pale than the male, that it is with difficulty one associates it with that sex. So dissimilar are the sexes that Coquillett in describing *terminalis* failed to associate with the male two females taken at the same time and place.

It was this sex which he recorded* as *neptis* Loew, from Chicago. There are females in collection from Delaware county, Pennsylvania, Plummers Island, Maryland, August 3, 1912 (J. R. Malloch); Georgia (no other data); and a specimen reared from mine in leaves of Solidago, July 20, 1884, Virginia (T. Pergande). I have also seen a male and female taken by W. L. McAttee, on Plummers Island, Maryland; and specimens in C. W. Johnson's collection from the following localities: Hanover, New Hampshire; Machias, Maine; Eastport, Maine; Chester, Massachusetts; Winnipauk, Connecticut; Danbury, Connecticut, Rowayton, Connecticut; Buttonwoods, Rhode Island; Norwich, Vermont, and Cornish, New Hampshire. The type specimen of *taeniola* Coquillett is a male of this species.

A peculiarity about this species is that after death the eyes are red, whereas in practically all the other species they become brown or black.

34. *Agromyza neptis* Loew.

Syn: *Agromyza neptis* Loew, Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 93.

Male: Frons black, one-third as wide as head; center stripe opaque brown-black; orbits glossy, each orbit about one-third as wide as center stripe; four orbital bristles present, the hairs on orbits in an irregular row between bristles and eye margin; ocellar region raised, glossy black; antennæ black, rather above the average size; second joint

*Bull. 10, n. ser., 1898, Dept. Agric. p. 78.

with rather weak dorsal bristle, and weak apical marginal hairs; third joint large, distinctly longer than broad, covered with distinct pale pile; arista brown, tapering, distinctly and thickly covered with short pubescence, which is about as long as basal diameter of arista; length of arista equal to three times the length of third antennal joint; face subshining, black, rather long, concave in profile, central keel slight, but sharp; cheek black, almost linear, slightly higher at posterior margin. Marginal bristles weak; vibrissa weakly differentiated, eye distinctly higher than long; proboscis yellow; palpi black, normal. Mesonotum glossy black, thickly covered with rather long setulae, three pairs of dorso-centrals present, the anterior pair weak; the pair of bristles between the posterior dorso-centrals as long as second pair of dorso-centrals; pleurae glossy black, with a slight indication of pale color along upper margin, and distinctly pale below wing base; squamae yellowish white, fringe white; postnotum and scutellum concolorous with mesonotum, the apical pair of bristles on scutellum as strong as basal pair. Abdomen glossy black, similar in shape to that of *parvicornis*. Wings clear; first costal division almost one-half as long as second, inner cross vein at slightly beyond middle of wing and at distinctly more than its own length from inner; last section of fifth vein distinctly shorter than penultimate section. Halteres white.

Length 2 mm.

Originally described from District of Columbia (Osten Sacken). Aldrich gives it as from Nebraska, but probably refers to another record of the species. I have before me only one specimen which is referable to this species.

Locality: Plummers Island, Maryland, August 3, 1912 (J. R. Malloch).

Food-plant unknown.

35. *Agromyza inconspicua*, new species.

Male: Frons slightly over one-third the width of head; black, center stripe opaque, orbits and ocellar region shining; four orbital bristles present, orbits otherwise almost entirely bare; antennae black, brownish at base; third joint small, rounded, not as long as broad, arista slightly swollen and tapering at base, pubescence very short, length of arista equal to from its base to upper orbital bristle; face black, concave in profile, slightly produced at mouth margin; center keel rounded; cheek brownish yellow, twice as high at posterior as at anterior margin, at highest part one-third as high as eye, marginal bristles of moderate strength, vibrissa slightly differentiated; proboscis yellow; palpi black; occiput linear on upper half. Mesonotum shining black, three pairs of dorso-centrals present, the anterior pair weak and anterior to the suture a setula which may, in other specimens, be strong enough to be classed as a dorso-central; disk very sparsely covered with setulae, only three irregular rows between the dorso-centrals; no distinct bristles between the posterior pair of dorso-centrals; pleurae

glossy black, median vertical suture narrowly pale yellow; scutellum sub-opaque, brownish-black; apical pair of scutellar bristles strongest. Abdomen rather narrow; shining black-brown; hypopygium normal in size. Legs black-brown, knees distinctly yellow; tarsi yellowish brown, no distinct bristles on posterior surface of mid tibia. Wings narrow, clear, veins on basal half pale yellow; costa brown, first division about half as long as second; inner cross vein at distinctly anterior to end of first vein and middle of discal cell; outer cross vein at distinctly more than its own length from inner and very slightly before middle of wing; veins 3-4 on last sections almost parallel; last section of fifth vein about one-fourth longer than penultimate section. Halteres yellow, knob whitish.

Length slightly over 1 mm.

Type: Cat. No. 15575, U. S. N. M.

Locality: Fort Collins, Colorado, reared from mine in *Agropyron*, July 28, 1910, (C. N. Ainslie). Webster's No. 6611.

36. *Agromyza dubitata*, new species.

Female: Frons black, center stripe opaque, orbits shining at base of bristles; breadth of frons a little over one-third the width of head, of each orbit about one-half the width of center stripe; four rather weak orbital bristles present, situated on near to inner margin of orbit; the orbital hairs less numerous than in *californiensis*; ocellar region shining black, raised, the ocelli in an equilateral triangle; antennæ black, rather smaller than in preceding species, the third joint not so regularly rounded at apex on upper surface; arista similar to *californiensis*, but slightly shorter; face brown-black, opaque, concave in profile; cheeks brown, almost as in preceding species; proboscis yellow; palpi spatulate, with several moderately strong end bristles; occiput narrow on upper half. Mesonotum shining black, bristled as in preceding species, but the pair of bristles between posterior pair of dorso-centrals shorter and more widely placed; pleuræ, squamæ, post-notum and scutellum as *californiensis*. Abdomen shining black; ovate; last segment with the hind marginal bristles moderately strong. Legs almost entirely black, the knees brownish, or the tibiæ and tarsi brown. Halteres yellow, knob paler.

Length 3-4 mm.

Type: Cat. No. 15576, U. S. N. M.

Locality: Beverly, Massachusetts, July 19, 1869, (Burgess). Other localities: Cottage Beaulieu, Ottawa, and Ile de Montreal, Ottawa, Canada, June and July, 1906. Nine specimens.

Food-plant unknown.

37. *Agromyza parvicornis* Loew.

Plate XXIX, Fig. 11; Plate XXXI, Figs. 35, 37.

Syn: *Agromyza parvicornis* Loew. Dipt. Amer. Sept. Indig., Cent. 8, 1869, species 92.

Male and Female: Frons black or black-brown, opaque, orbits slightly shining, black, four orbital bristles present; orbits differentiated from center stripe, bristles situated nearer inner than outer margin of orbits, a few weak hairs in an irregular row laterally beyond them; antennæ brown or brownish black, rather below the normal size; third joint short, rounded in front, thickly covered with soft, short, whitish pilosity; arista brown, generally yellowish near base, except on the short thickened portion which is glossy black; pubescence very close, generally distinct; length of arista equal to from its base to upper orbital bristle; face brown, nearly perpendicular in profile, the central keel slight; cheeks brown, or yellowish brown, very much higher posteriorly than anteriorly, at highest part one-third as high as eye; marginal bristles numerous; vibrissa differentiated, but not very strong; proboscis brown; palpi black, very slightly dilated, weakly bristled. Mesonotum glossy black; disk thickly covered with short setulæ; two pairs of dorso-centrals present; the bristles between the posterior pair distinct; pleuræ, scutellum and postnotum concolorous with disk of mesonotum, pleural sutures rarely, and beneath wing bases generally yellowish; squamæ whitish yellow, fringes brown. Abdomen colored as thorax; hypopygium of male as Fig. 35, Plate XXXI. Legs black, the tibiæ and tarsi sometimes paler, brownish yellow, most distinct on knee joints; mid tibia with the posterior bristles distinct. Wings clear, slightly grayish on anterior half; venation as in figure, halteres yellow, the knob whitish.

Length 3-4 mm.

Originally described from District of Columbia, (Osten Sacken). Larva lives in mines in leaves of corn; occurs in the following states: Florida, District of Columbia, Indiana, Vermont, Maine, Massachusetts, Connecticut, New Hampshire, Wisconsin, Alabama, South Carolina, Illinois and Texas. Probably generally distributed throughout the United States. A full list of localities will be given in the bulletin in preparation dealing with the economic importance of this species and several others affecting field and forage crops.

38. *Agromyza viridula* Coquillett.

Syn: *Agromyza viridula* Coquillett, Jour. N. Y. Ent. Soc., Vol. X, 1902, p. 190.

Female: Frons black, center stripe opaque, orbits distinctly differentiated, shining; breadth of head one-third, or slightly over one-third, the head width; each orbit about one-fourth as wide as center stripe; four strong orbital bristles present, and beyond these, laterally, an irregular row of short hairs; lunule white pollinose; ocellar region shining black; antennæ of moderate size, second joint with distinct dorsal bristles and very weak apical hairs; third joint rounded, not as long as broad, covered with very short, whitish pile; arista thickened at base, tapering on basal third, bare, as long as from its base to anterior ocellus; face black, opaque, concave in profile, mouth margin slightly produced, keel very slight; cheek linear at anterior margin, at posterior margin about one-sixth as high as eye, marginal bristles moderately strong, increasing in length towards anterior margin; vibrissa differentiated; occiput not visible on upper half; proboscis yellow; palpi black, of moderate size, the bristles distinct. Mesonotum glossy black; the pair of bristles between posterior pair of dorso-centrals well defined; pleuræ glossy black, brownish below wing base; squamæ whitish, fringe white; bristles on scutellum subequal. Abdomen glossy black, with a distinct brassy sheen, ovate, bristled as in *parvicornis*. Legs shining black; tarsi brownish; mid tibia with posterior pair of bristles distinct. Wings clear, veins black-brown; second costal division $2\frac{1}{2}$ times as long as first; subcostal vein distinct; fused with first at its apex; inner cross vein at slightly before end of first vein, and distinctly before middle of discal cell; outer cross vein at wing middle, and $1\frac{1}{2}$ times its own length from inner cross vein; last section of fifth vein little over one half as long as penultimate section, sixth vein distinctly short of wing margin. Halteres with yellow stalk and white knob.

Length 2.5–3 mm.

Redescribed from type specimen (Cat. No. 6660, U. S. N.M.)

Locality: District of Columbia, June, (collection Coquillett). The other specimens in collection are from District of Columbia, July; Maryland, June; Georgia; Beverly, Mass.; June 29, 1876, (Burgess); and three specimens from the West Indies in poor condition that probably belong to this species, Aguadilla, and Mayaguez, Porto Rico, (A. Busck), and St. Domingo, (A. Busck). These specimens are slightly smaller than the type, but have no distinctive characters by which they may be separated. I have also seen one specimen submitted by Prof. Chittenden of the Bureau of Entomology, from Plano, Texas, June, 1907 (E. S. Tucker) No. 561. There are three specimens in Prof. Webster's material labelled "Reared from blotch mine red oak leaf, June 20, 1912." Lafayette, Indiana, (J. J. Davis).

39. *Agromyza salicis*, new species.

Plate XXIX, Fig. 15.

Male: Frons black, center stripe opaque brown-black, orbits and ocellar region shining; width of frons about one-half the head width; each orbit about one-half as broad as center stripe; five distinct orbital bristles present, the hairs between these and the eye margin rather conspicuous and numerous; antennæ black; rather small; third joint rounded, distinctly shorter than broad; arista brown; swollen on basal fourth; pubescence very short, but distinct; length of arista not as long as from its base to second uppermost orbital bristle; face black, subopaque, retreating towards mouth margin; cheek brown-black, distinctly higher at posterior than at anterior margin, at highest point more than one-half as high as eye; marginal bristles of moderate strength; vibrissa hardly differentiated; proboscis yellow; palpi black, of moderate size. Mesonotum shining black; three distinct pairs of dorso-centrals present; the anterior pair distinctly weaker than the other two pairs, and close to suture; the pair of bristles between the posterior pair of dorso-centrals weakly differentiated; pleuræ shining black, brownish along sutures and below wing base; squamæ grayish, fringe dark brown; scutellum and postnotum concolorous with disk of mesonotum, the former with the bristles subequal. Legs black; mid tibia without distinct posterior bristles. Abdomen black-brown, shining, covered with short setulæ; hypopygium glossy black, small. Wings rather narrow; second costal division $2\frac{1}{2}$ times as long as first; subcostal vein distinct; fused with first at its apex; inner cross vein at about apex of junction of first vein with costa; outer cross vein at distinctly, but not greatly, before wing middle, and at slightly more than its own length from inner cross vein; last section of fifth vein subequal with penultimate section; sixth vein indistinct. Halteres black.

Length 2 mm.

Type: Cat. No. 15577, U. S. N. M.

Locality: Reading, Massachusetts, May 16, 1908. New York State Collection, from Willow, (E. P. Felt). One male.

40. *Agromyza winnemanæ*, new species.

Female: Deep black, glossy; abdomen with an indication of metallic bluish sheen. Frons deep black, center stripe opaque; orbits glossy; width of frons slightly more than one-third the head width; each orbit a little less than one-fourth the width of center stripe; four orbital bristles present; an irregular row of weak hairs between eye and orbital bristles; antennæ of moderate size; second joint with distinct dorsal bristle; third joint barely longer than broad, rounded at apex; arista swollen at base, tapering, bare, in length equal to from its base to second uppermost orbital bristle; face brownish black, opaque; almost perpendicular in profile, with slight, rounded keel; cheek very short, almost linear, not over one-eighth as high as eye, marginal

bristles weak; vibrissa distinctly differentiated though not very strong; proboscis brown; palpi black, normal; occiput linear, the eyes very large and occupying nearly the whole side of head. Mesonotum with two pairs of dorso-centrals; disk covered with short setulæ; the pair of bristles between the posterior dorso-centrals not differentiated from the other discal setulæ; squamæ yellowish brown, fringe brown; apical bristles on scutellum weaker than the basal pair. Abdomen with segments covered with short setulæ, those on the posterior margins slightly stronger; sixth segment slightly elongated; base of ovipositor not as long as preceding segment. Legs shining black; posterior surface of mid tibia, in type, without any bristles. Wings clear; second costal division a little over twice as long as first; subcostal vein indistinct, coalescent with first at its apex; outer cross vein at distinctly before wing middle, and at its own length from inner; fourth vein rather indistinct from outer cross vein to apex; last section of fifth distinctly, but not greatly, longer than penultimate section; costa not reaching beyond end of third vein. Halteres black.

Length 3 mm.

Type: Cat. No. 15578, U. S. N. M.

Locality: Plummers Island, Maryland, June 27, 1909, (W. L. McAtee), one female.

Food-plant unknown.

41. *Agromyza simplex* Loew.

Syn: *Agromyza simplex* Loew, Dipt. Amer. Sept., Cent. 8, 1869, species 84.

Male and Female: Entirely shining black. Frons occupying distinctly more than one-third the width of head; center stripe opaque; orbits glossy; ocellar region glossy; the frontal triangle distinguishable, but not separated from center stripe by an impressed line; five orbital bristles present, in addition to those there are numerous soft hairs covering the entire surface, laterally, beyond the bristles, and stretching from opposite base of antennæ to upper orbital bristle; antennæ rather small, second joint with moderately long dorsal bristle; third joint rounded, with very short, whitish pile; arista bare, the base swollen, length of arista equal to from its base to between uppermost two orbital bristles; face slightly keeled, concave in profile, opaque, brown-black; cheeks opaque brown; orbits carried almost to hind margin of eye, shining; height of cheek at anterior margin less than at posterior, where it is about two-fifths as high as eye; marginal bristles rather weak, upturned; vibrissa weakly differentiated; proboscis brown; palpi black, normal. Mesonotum covered with short setulæ; two distinct pairs of dorso-centrals present, and in addition to these there are generally 2-3 setulæ anterior to them stronger than the discal hairs; squamæ black-brown, fringe concolorous; scutellum with the apical two bristles weaker than the basal two. Abdomen broadly ovate in female, somewhat narrower in male; no metallic sheen visible; last abdominal segment in female elongate; apical bristles on segments not conspicuous; base of ovipositor not longer than preceding

segment; male hypopygium exposed, rather small. Legs entirely black; mid tibia with the posterior bristles present, but weak. Wings grayish; veins black; subcostal vein indistinct, joining first vein near its apex; first costal division half as long as second; inner cross vein at below end of first vein; outer cross vein at about one-half its own length from inner; last section of fifth vein slightly longer than penultimate section. Halteres black.

Length 2.5-3 mm.

Originally described from the Middle States. Recorded in the Smith Catalogue for New Jersey, and from New York in Bull. 189, N. Y. Exper. Sta. 1900. Represented in collection by two specimens from Berlin, Germany, (C. Schirmer) labeled *Agromyza schineri* Loew, in Coquillett's handwriting. The only other specimen I have ever seen was reared from asparagus by I. J. Condit, Portsmouth, Virginia, submitted by Prof. Chittenden of the Bureau of Entomology.

This species attacks asparagus and in the New York Bulletin above mentioned is an account of its life history. Giard* has found it in France, and Collin† in England, associated with the same plant.

42. *Agromyza vibrissata*, new species.

Plate XXVIII, Fig. 2; Plate XXX, Figs. 24, 25.

Male: Frons opaque brown-black, only the orbits and ocellar triangle slightly shining; breadth of frons nearly one-half the head width; six orbital bristles present, the lower, or anterior, two lying close to surface of the frons, which is rather buccate, and pointing backward and slightly inward; numerous closely placed short hairs on orbits between bristles and eye margin; lunule depressed; face sunk in and with a central keel, which is raised on a level with eye orbits; antennæ brown, rather small and half hidden in face cavities; arista yellowish brown, distinctly swollen at base, bare, not three times as long as third antennal joint; face black, a yellowish brown patch on center of epistome; epistome much produced; cheeks brown; eye orbit distinct; cheek, including orbit, two-fifths as high as eye; marginal bristles weak, vibrissa formed of a fasciculus of bristles, which is about two-fifths as long as length of cheek; proboscis yellowish-brown; palpi black, slightly spatulate, and weakly bristled. Mesonotum shining black; covered with short setulæ and with two pairs of dorso-central bristles; the pair of bristles between the posterior dorso-centrals not differentiated; pleuræ glossy brown-black, the sutures, and below wing base paler; the normal bristles present, squamæ yellowish, fringe brown; scutellum, and postnotum concolorous with disk of mesonotum; the former with the posterior pair of bristles slightly reduced

*Bull. Soc. Ent. France, 1894, p. 179.

†Ent. Mon. Mag., Vol. XXII, 1911, p. 254.

in size. Abdomen glossy black; all segments with numerous short hairs on dorsum; those on lateral margins of segments longer; the posterior margin of last abdominal segment not noticeably bristly; last segment slightly elongated; hypopygium small. Legs black-brown, shining, tibiae and tarsi paler; posterior bristles on mid tibia present, but not large. Wings clear; veins brown; first costal division fully one-half as long as second; subcostal vein indistinct, fused with first at near apex; inner cross vein below swelling caused by junction of first vein and costa; outer cross vein at wing middle, and at nearly its own length from inner; last section of fifth vein slightly shorter than penultimate section. Halteres black.

Length 3.5 mm.

Female: Similar in color and size to the male, but the cheeks as in figure 25; the last segment of abdomen has the bristles at apex stronger than in the male; and the ovipositor is glossy black.

Type: Cat. No. 15579, U. S. N. M.

Locality: Georgia, no other data on specimens. Two males, one female.

Food-plant unknown.

43. *Agromyza affinis*, new species.

Female: Frons black, center stripe opaque, orbits shining; breadth of frons slightly over one-third the head width; orbits less than one-half the width of center stripe: four strong orbital bristles present, on both sides there is a weaker bristle close under the front one; hairs on orbits, between bristle and eye margin, short, but numerous, on front half of orbit; antennae black, of moderate size; second joint with distinct dorsal bristle; third joint rounded, pilosity very short, dark; arista black, basal swelling slight and tapering, pubescence very short and close; length of arista equal to from its base to a little beyond second uppermost orbital bristle; face black, opaque, concave in profile, mouth margin produced, keel distinct; cheek black, brown on lower half, higher anteriorly than posteriorly, vibrissa very clearly differentiated from the marginal bristles; proboscis brown; palpi in type retracted. Mesonotum shining black; two distinct pairs of dorso-centrals present; disk covered with short setulae, which are carried back beyond the transverse line of the posterior pair of dorso-centrals; pleurae shining black, brownish along sutures and below wing base; squamae brown-black, fringe almost black; scutellum concolorous with disk of mesonotum. Abdomen glossy black; all segments with discal setulae; those on posterior margin of sixth segments most noticeable, but not strong; base of ovipositor distinctly longer than preceding segment, its surface covered on the sides and apex with short hairs. Legs entirely black, shining; posterior surface of mid tibia without distinct bristles. Wings grayish, veins brown; outer cross vein at distinctly less than its own length from inner, and at wing middle; last section of fifth vein distinctly shorter than the penultimate section. Halteres black.

Length 2 mm.

Type: Cat. No. 15580, U. S. N. M.

Locality: Glen Echo, Maryland, June 3, 1898 (R. P. Currie). This species comes very close to the European *curvipalpis* Zetterstedt, but the two males of that species in collection (Bonhill, Dumbartonshire, Scotland, May, 1907-1908, J. R. Malloch) have the arista bare, the basal swelling much more pronounced, and elongate; the frons half as broad as width of head; the last section of fifth vein about equal to the penultimate section, and the outer cross vein before wing middle. It may be well to indicate here that the name *curvipalpis* (Dipt. Scand. Vol. 7, 1848, p. 2782, species 44) was given to this species because of a misapprehension on the part of Zetterstedt, who mistook the vibrissæ for a prolongation of the palpi. Schiner in Fauna Austriaca followed him in this respect. The species was afterwards described by Kaltenbach as *bicornis* (Pflanzenf. 1873, p. 330, species 33).

In the collection are three specimens which may be males of *affinis*, but their condition is so poor that I do not consider it desirable to either place their description on record as such, or describe them as belonging to another species.

The localities are, Key West, Florida, January 1 and February 6, 1869, (Hubbard-?) and one from North Carolina, without other data.

Food-plant unknown.

44. *Agromyza insularis*, new species.

Plate XXXI, Fig. 38.

Male and female: Frons black; center stripe opaque, orbits and the weakly defined ocellar triangle shining; breadth of frons in female barely one-third as wide as head, in male slightly wider; each orbit equal to about one-fourth the width of center stripe; four rather weak orbital bristles present; in addition to the bristles there is an irregular row of very short hairs nearer to eye margin; frons in profile declivitous, not projecting; antennæ brown-black, small; third joint not as long as broad, rounded in front, distinctly pilose; arista black, basal fifth thickened, tapering, almost bare, length equal to from its base to second uppermost orbital bristle; face black, concave, mouth margin slightly produced; cheek black-brown, narrow, almost linear at posterior margin, distinctly higher anteriorly, but not very much produced; vibrissa in male fasciculate in form, the length not equal to that of cheek, and not very conspicuous; in female the vibrissa is distinct and almost as long as in male, but consisting on only one bristle; marginal cheek bristles much weaker than vibrissa; proboscis brownish

yellow at apex; palpi black, rather short and slightly spatulate, the bristles weak; occiput linear. Mesonotum shining black; two pairs of dorso-centrals present; the discal setulæ very sparse behind anterior pair of dorso-centrals, and not carried to level of transverse line of posterior dorso-centrals; pleuræ glossy brown or blackish, margin and fringe black-brown; scutellum concolorous with disk of mesonotum, the bristles subequal. Abdomen glossy black; ovate; segments with numerous short setulæ, posterior margins with more distinct bristle-like setulæ; base of ovipositor glossy black. Legs black. Wings grayish; veins black-brown; second costal division slightly more than twice as long as first; subcostal vein indistinct, coalescent with first at its apex; inner cross vein at below end of first; outer at its own length from inner, and at slightly before wing middle, last section of fifth vein barely longer than penultimate section; veins 3-4 slightly divergent on last sections. Halteres black.

Length barely 1.5 mm.

Type: Cat. No. 15581, U. S. N. M.

Locality: Cayamas, Cuba, December (E. A. Schwarz). Male and female, taken in cop.

45. *Agromyza texana*, new species.

Male and Female: This species is very similar to *insularis* in general appearance, but differs as follows: The arista is not so much swollen at base, nor for such a long distance; the cheek is much more distinctly produced in both sexes, and comparatively higher anteriorly; the vibrissa is much more conspicuous in the male, and as long as cheek length, in female the vibrissa is comparatively weak and not nearly so long as in male, consisting of one hair only; the thorax is more densely covered with setulæ, which are carried at least to level of transverse line of posterior dorso-centrals; the legs are black in both species and the posterior bristles are absent from mid tibiæ; the wings have the outer cross vein at wing middle, or very slightly beyond it, and the last section of fifth vein slightly shorter than penultimate section.

Length 1.5-2 mm.

Type: Cat. No. 15582, U. S. N. M.

Locality: Brownsville, Texas, January 27, 1909 (Mc-Millan and Marsh). reared from Roripa. One male.

Paratypes: Cabin John Bridge, Maryland, April 28, 1912, two females (Knab and Malloch); Brownsville, Texas, January 27, 1909, one female, same data as type; and one female Veitch, Virginia, June 9, 1912 (F. Knab).

46. *Agromyza abnormalis*, new species.

Plate XXIX, Fig. 9.

Fentale: Frons black-brown; center stripe opaque; orbits black, shining; breadth of frons over one-third that of head; orbits at widest part one-third as wide as center stripe at that part; five strong orbital bristles present, and in the type a weak one anterior to the lower strong one; upper two bristles situated near to inner margin of orbits, the others nearer to center; besides the bristles there are scattered short hairs present on the orbits nearer to eye margin than bristles; ocellar region raised, shining black; ocellar triangle not defined; frons in profile slightly protruding anteriorly; antennæ black-brown, of moderate size; dorsal bristle on second joint distinct; third joint rounded in front, slightly longer than broad, pilosity very short; arista rather thick, swollen more distinctly on basal fifth, pubescence short, but distinct; length of arista equal to from its base to upper orbital bristle; face shining black, slightly retreating, mouth margin not produced, center keel very slight; cheek opaque brown, half as high anteriorly as posteriorly, where it is half as high as eye; marginal bristles of moderate length; the vibrissa slightly differentiated; proboscis yellow; palpi black, normal; occiput slightly projecting. Mesonotum black, subshining; four pairs of dorso-centrals present, the anterior pair in front of suture, discal setulæ numerous and rather regularly arranged in rows, of which there are about five between the dorso-centrals; no differentiated bristles between posterior pair of dorso-centrals; pleuræ shining black, the sutures and below wing base brown; squamæ gray-brown, margins black-brown, fringe brown; scutellum concolorous with disk of mesonotum, the bristles subequal. Abdomen black, glossy; segments rather strongly setulose; ovipositor very glossy black. Legs black, tibiæ and tarsi brownish; mid tibia without posterior bristles. Wings grayish; first costal division distinctly over one-half as long as second; subcostal vein indistinct, but complete, not fused with first at its apex; inner cross vein distinctly, but not greatly in front of end of first vein, and at or slightly beyond middle of discal cell; outer cross vein at about its own length from inner and very slightly beyond end of first vein; veins 3-4-5 gradually and slightly divergent on their last sections; last section of fifth vein twice as long as penultimate section. Halteres brown.

Length 3 mm.

Type: Cat. No. 15583, U. S. N. M.

Locality: Washington, District of Columbia, June, 1903, No. 9727—"on Aphid"—"On roots of Amaranthus."

Paratype: labeled "Twilight" Lawrence, Kansas, (E. S. Tucker).

47. *Agromyza virens* Loew.

Dipt. Amer. Sept. Indig. Cent. 8, 1869, species 84.

Male and Female: Frons black, orbits and ocellar triangle glossy, center stripe opaque; breadth of frons slightly over one-third that of head; breadth of orbits over one-third that of center stripe; five orbital bristles generally present, the orbits densely covered with short, fine, hairs; frons generally slightly buccate; antennæ brown-black, of moderate size; third joint rounded; arista slightly swollen at base, very thickly, but shortly pubescent; as long as from its base to upper orbital bristle; face concave in profile, brown-black; cheeks higher at posterior than anterior margin, at highest part about one-fourth as high as eye; marginal bristles of moderate strength; vibrissa differentiated; proboscis brown; palpi black, normal; occiput slightly projecting; eyes generally distinctly and thickly pubescent above. Mesonotum glossy black, with sometimes a bluish or greenish tinge; squamæ white, or yellowish, the margin yellowish, fringe pale yellowish, or white. Abdomen glossy black, generally with a metallic tinge, either bluish, greenish, or bronzy; in shape and vestiture as in *tilia*. Legs as in *tilia*; the posterior mid tibial bristles distinct. Wings grayish, or almost clear, veins brown; venation almost as in *tilia*.

Length 1.5-2.5 mm.

Specimens from Lafayette, Indiana (F. M. Webster). Mining in roots of clover. There are five other specimens in collection with Webster's No. 10,073, from Lafayette, Indiana; one from Gladbrook, Iowa, February 14, 1890, (No. 4608) mining in stems of *Ambrosia artimisaefolia* (A. M. Sharp); two from Cambridge, Massachusetts, "mining in stems of a weed" (H. G. Hubbard); one marked 30420, referred to as a Tachinid in notes, from stem of a weed in which some species of Cecidomyid was mining, April 18, 1883 (locality doubtful); two specimens labeled "Parasitic on Cecidomyid on aster with yellow flowers," May 23, 1884 (locality doubtful); two from stems of *Ambrosia*, March, 1895, District of Columbia, one from *Nabalus albus*, May 14, 1883 (locality doubtful); two from California (Alameda and Los Angeles), collection Coquillett; one from Georgia, no other data; one from Flagstaff, Arizona, July, (H. S. Barber). One from Plummers Island and four from Washington, D. C. are in the collection of W. L. McAtee and a series of 13 specimens from the Brodie collection are in the U. S. National Museum collection, locality Toronto, Ontario, Canada.

In some cases, I believe with specimens which have been on the wing, it is not very easy to see the hairs on the eyes, but in freshly emerged examples these are very noticeable on

the upper surface of the eyes close to the orbits. A single specimen from Claremont, California (Baker), may belong to a distinct species.

48. *Agromyza cærulea*, new species.

Plate XXIX, Fig. 13.

Female: Frons black; center stripe opaque brown-black, orbits and ocellar triangle glossy black; width of frons equal to slightly over one-third that of head; each orbit slightly less than one-fourth the breadth of center stripe; four strong orbital bristles present, the orbital pubescence not very conspicuous; frontal triangle fairly well defined, reaching over three-fourths of the way to lunule; lunule shining, brownish, with indications of whitish pollinosity; antennæ small, black; dorsal bristle on second joint long; third joint not longer than broad, rounded at apex, pilosity pale, very short; arista thickened and tapering on basal fourth, pubescence distinct, slightly longer than basal diameter of arista, length of arista equal to from its base to upper orbital bristle; face short, black, concave in profile; cheek short, shining black, marginal bristles very numerous, strong, and irregularly arranged, not in a single row, carried upward beyond the level of the weakly differentiated vibrissa; proboscis yellow at apex; palpi black, numerous bristled; occiput not produced. Mesonotum glossy blue-black, more inclining to brown-black on lateral margins; two distinct pairs of dorso-centrals present; disk covered with numerous short setulæ; no distinct bristles between the posterior dorso-centrals; pleuræ glossy blue-black, sutures and below wing base brown; squamæ white, fringe concolorous; scutellum concolorous with disk of mesonotum, the marginal bristles subequal. Abdomen ovate, bronzy blue-black; first two segments short, the others subequal, all segments with short discal setulæ, those on posterior margins of segments strong; base of ovipositor not longer than preceding segment. Legs strong, especially the femora, which are thickened; black, shining, tibiæ at base brownish; fore tibia with a strong bristle on posterior surface at below middle; the pair of bristles on posterior surface of mid tibia strong. Wings clear, veins brownish yellow; second costal division about twice as long as first; subcostal vein indistinct; outer cross vein at slightly below wing middle, and at a little more than its own length from margin to wing on fifth vein, and from inner cross vein; veins 2-3 divergent, 3-4 slightly convergent at apices; inner cross vein at below junction of first vein with costa, and at middle of discal cell. Halteres black, pedicel yellowish brown.

Length 3-4 mm.

Type: Cat. No. 15584, U. S. N. M.

Locality: The specimen bears the M. S. label "S. J. Allende, Mexico," and the numbers 11-29, which probably means that it was taken on November 29. I cannot find on the available maps of Mexico any locality in accordance with that on the label. No collector's name is given. One specimen.

Food-plant unknown.

49. *Agromyza burgessi*, new species.

Plate XXXI, Fig. 34.

Female: Frons black; center stripe brown-black, opaque, orbits glossy black; breadth of frons distinctly, but not greatly, over one-third the width of head; breadth of each orbit about equal to one-fourth the width of center stripe; generally six strong orbital bristles present, in one specimen five only; the bristles situated on nearer to inner than outer margin of orbits; the space between eye margin and bristles thickly covered with short hairs; ocellar triangle poorly defined anteriorly, the gloss on surface not continuing to its apex; lunule whitish pollinose; frons projecting slightly anteriorly, giving the head a somewhat buccate appearance; eye orbit continued to almost hind angle of eye; glossy black; antennæ small, brown; third joint not longer than broad, regularly rounded at apex; arista swollen at base, bare, as long as from its base to between second and third uppermost orbital bristles; cheek brown, distinctly higher at posterior than at anterior margin, and at highest point distinctly over one-third the height of eye; marginal bristles of moderate strength, not numerous; vibrissa well differentiated; proboscis brown; palpi black, slightly spatulate, weakly bristled at apex; occiput distinctly visible on upper half. Mesonotum black, glossy, without any distinct bluish fringe; bristles as in *cærulea*; pleuræ brown-black, the sutures and below wing base pale brown; squamæ grayish, margin black-brown, the fringe brown; scutellum black, glossy, bristles subequal. Abdomen glossy black or brown-black, with, in some lights, a bronzy luster; second segment not so distinctly shortened as in *cærulea*; in other respects similar to that species. Legs similar to previous species, but the bristle on fore tibia is weaker. Wings in most respects similar to *cærulea*, but the third and fourth veins are distinctly divergent on their outer sections. Halteres brown.

Length 3.5-4 mm.

Type: Cat. No. 15585, U. S. N. M.

Locality: Beverly, Massachusetts, June 2, 1876 (Burgess).

Specimens of this species are in collection from Tower City, North Dakota, (G. I. Reeves), Webster's No. 3122, 2 females; and Colorado, No. 1563, no collector's name, 1 female. I have named this species in honor of the late Edward Burgess, who collected the type specimen 37 years ago. I have seen one specimen in C. W. Johnson's collection from Lancaster, New York, which has the bristles on fore tibia indistinguishable.

Food-plant unknown.

50. *Agromyza plumiseta*, new species.

Female: Frons black, center stripe opaque, orbits, ocellar region, and the well defined ocellar triangle glossy black; breadth of frons one-third the head width, ocellar triangle reaching three-fourths of the way to lunule, which is whitish pollinose; orbital bristles four in number, moderately strong; hairs on orbits numerous and irregularly arranged; each orbit one-fourth the width of center stripe; the bristles situated close to inner margin; antennæ of moderate size, deep black; third joint rounded in front, not as long as broad; second joint with distinct dorsal bristle; arista brown, swollen at base, pubescence very distinct, longer than basal diameter of arista, length of arista equal to from its base to upper orbital bristle; face black, concave, mouth margin slightly produced; cheek very short and low; marginal bristles rather weak, vibrissa well differentiated; proboscis yellow at apex; palpi black, slightly spatulate, and weakly bristled at tips; occiput not projecting. Mesonotum blue-black; two pairs of dorso-centrals present; setulæ numerous on disk, continued posteriorly beyond transverse line of posterior dorso-centrals; pleuræ black, shining, with a bluish sheen, the sutures, and below wing base brown; squamæ yellowish white, fringe concolorous; scutellum colored as disk of mesonotum, apical pair of bristles very slightly smaller than basal pair. Abdomen black, with a distinct, metallic blue sheen; basal segment brown; all segments with very numerous discal setulæ, those on apices of segments most distinct; sixth segment very slightly elongated; base of ovipositor not longer than preceding segment. Legs black, shining, strong; posterior surface of mid tibia with the pair of bristles distinct. Wings clear; veins brownish yellow; first costal division barely more than one-third as long as second; inner cross vein at below end of first vein and at middle of discal cell; outer cross vein at very slightly beyond wing middle, and at more than its own length from inner; veins 2-3-4 gradually divergent on their last sections; last section of fifth vein about two-thirds as long as penultimate section. Halteres black.

Length 2 mm.

Type: Cat. No. 15586, U. S. N. M.

Locality: Bayamon, Porto Rico, January, 1899, (A. Busck) Along with the type there is a male from Fajardo, Porto Rico, February, 1899 (A. Busck), which belongs here. It differs only in having the frons slightly less than one-third the head width and though in poor condition is evidently, in other respects, identical with the female.

Food-plant unknown.

51. *Agromyza websteri*, new species.

Male and Female: Frons deep black; center stripe opaque, orbits and ocellar triangle glossy; width of frons almost one-half that of head, narrower at anterior margin than posteriorly; width of each orbit about one-fourth that of center stripe; five orbital bristles generally present, but sometimes there are six in aberrant specimens; besides the bristles, which are situated on close to inner margin of orbit, there is an outer irregular row of short black hairs; antennæ of moderate size, black with sometimes whitish pollinosity; second joint with distinct dorsal bristles, and weak apical hairs; third joint rounded, distinctly shorter than broad, pilosity very short, whitish; arista with a distinct, elongate thickening at base, which occupies almost one-third the length of arista; pubescence very indistinct; length of arista equal to from its base to middle of orbit; face opaque black; concave in profile, the mouth margin slightly produced; cheek opaque black; of almost equal height on its entire length, which is equal to about one-fourth the eye height, marginal bristles in a double row, the upper slightly upturned, of moderate length; vibrissa distinctly differentiated; proboscis yellow-brown at apex; palpi black, slightly spatulate, weakly bristled. Mesonotum subshining black, with slight indications of grayish pollinosity, especially on sides; disk very thickly covered with short, upright, black setulæ; three pairs of dorso-centrals present, the anterior pair weak, and occasionally there are 2-3 setulæ in line with those, which are distinctly longer than the other discal setulæ, but which are clearly not macrochætæ; no differentiated bristles between the posterior dorso-centrals; pleuræ black, subshining, sutures brownish; squamæ brown, or gray, the margin blackish, fringe black-brown; scutellum concolorous with disk of mesonotum. Abdomen shining black; broadly ovate; segments with distinct dorsal setulæ, those on posterior margins, and especially on sixth segment, in female, longer; sixth segment slightly elongated; base of ovipositor glossy black; male hypopygium small, shining black. Legs black, shining; femora strong; no bristles distinguishable on mid tibia in any of the specimens before me. Wings grayish; veins brown-black; first costal division distinctly more than one-half as long as second; subcostal vein distinct; fused with first at apex; inner cross vein below end of first vein; outer cross vein not upright, its upper extremity nearer to wing tip than its lower, situated at generally less than its own length from inner cross vein, and its upper extremity just before wing middle; veins 3-4 distinctly divergent at their apices; last section and penultimate section of fifth vein subequal. Halteres black.

Length 3.5-4 mm.

Type: Cat. No. 15587, U. S. N. M.

Locality: Seattle, Washington, issued January 21, 1913, from galls on twigs of pink wistaria from Japan, (F. M. Rhoder). Another specimen from same lot, in poor condition January

19, 1913 from same lot of galls. There are four specimens representing both sexes marked Ex. galls on pink wistaria, Japan, B. B. Whitney, No. 745.

This species has been recorded as *Agromyza schineri* Giraud,* on the authority of Aldrich. *Schineri* was reared from poplar by Giraud in Europe,† and is a much smaller species. The description of Giraud's species is brief but does not permit of one identifying it with the Japanese species. I include this imported species in my paper because it evidently has every chance of becoming established in this country. One striking peculiarity of the specimens before me of this species is the amount of variation in the number of bristles on head, thorax and scutellum. In many cases the normal bristle is duplicated and the number on any one part is not so consistent as in the other species of *Agromyza*. The distance between the cross veins of the wing is also very variable. In the figure of the wing given in the California publication the costa is carried only to the third vein whereas in all my specimens it is continued to the fourth.

52. *Agromyza longiseta*, new species.

Plate XXXI, Fig. 30.

Female: Frons deep black; center stripe opaque; orbits, and ocellar region shining; ocellar triangle not defined; width of frons barely one-third that of head; orbits ill defined, each one not one-fifth as wide as center stripe; four strong orbital bristles present; only a few short hairs on orbits besides the bristles; frons unprojecting, but head somewhat buccate in profile; antennæ rather small, black; third joint regularly rounded in front, about as long as broad, covered with short pilosity; dorsal bristle on second joint distinct; arista very slightly, and shortly, swollen at base, distinctly pubescent, the pubescence as long as diameter of base of arista, length of arista as long as from its base to vertex; face opaque black, almost perpendicular in profile; cheek black, of almost equal height on its entire length, and not over one-sixth the height of eye, marginal bristles numerous and of moderate size, carried higher in front than level of the differentiated vibrissa; proboscis brown; palpi black, very slightly broadened at ends, and weakly bristled; occiput not projecting. Mesonotum glossy black, with a slight greenish or bluish tinge; two pairs of dorso-centrals present; squamæ very dark, the margin almost black, fringe blackish. Abdomen concolorous with mesonotum; the posterior margin of sixth segment with rather long bristles; base of ovipositor highly glossy, the surface

*Bull. Cal. State Com. Hort., Vol. I, No. 10, p. 730, 1912.

†Verh. zool-bot. Ges. Wien., Vol. II, 1861, p. 484.

bare except apically on sides, as long as the elongate sixth segment. Legs shining black; the posterior bristles on mid tibia distinct. Wings grayish; veins black-brown; subcostal vein distinct, fused with first at its apex; outer cross vein at wing middle, and at its own length from inner cross vein; inner at distinctly beyond middle of discal cell; last section of fifth vein not two-thirds as long as penultimate section; veins 3-4 slightly divergent at apices. Halteres black.

Length 2 mm.

Type: Cat. No. 15588, U. S. N. M.

Locality: Frontera, Tabasco, Mexico, March, (C. H. T. Townsend). One female.

Food-plant unknown.

53. *Agromyza tiliæ* Couden.

Syn: *Agromyza tiliæ* Couden, Proc. Wash. Ent. Soc., Vol. IX, 1907, p. 34.

Female: This species is very similar to *A. websteri*, but differs as follows: The antennæ are smaller, the third joint being rather below the average size; the arista is not so distinctly thickened at the base, nor for such a long distance, the thickening tapering gradually; the mesonotum is shining black; with two pairs of dorso-centrals; the pleuræ, scutellum, and abdomen glossy black; the squamæ and legs are similar in color to *websteri*, but the mid tibiæ has the posterior bristles distinct, though small; and in size *tiliæ* averages less, 2-3 mm. The venation in both species is rather variable, but the outer cross vein is generally at less than its own length from the inner.

The type series which is in rather poor condition, was reared from the galls on twigs of lime trees. Locality: Jennings, Missouri, March-April, 1907, (Mrs. Hickey).

The twig in collection shows the galls arranged on the surface, independent of the position of the leaf buds, whereas in *websteri* the galls are apparently confined to the bases of the buds. There are two specimens in collection, one male Veitch, Virginia, June 9, 1912, (F. Knab), and one female, Delaware County, Pennsylvania, July 23, 1892 (no collector's name), the former at least of which belongs to this species.

54. *Agromyza schineri* Giraud.

Syn: *Agromyza schineri* Giraud, Verh. zool.-bot. Ges. Wien, Vol. II, 1861, p. 484.

Male and Female: This species is very similar to *tiliæ* but differs as follows: The frons is distinctly broader, being over one-third as wide as head; the orbits are broader, the ocellar triangle is broader and shorter than in *tiliæ*, the ocelli not forming an equilateral triangle as in that species, the distance between the posterior pair being distinctly greater than that between those and the anterior one; the

arista is comparatively shorter and more distinctly swollen in *schineri* than in *tilia*; and the posterior surface of mid tibia in *schineri* has no distinct bristles.

Length 2-2.5 mm.

Originally described from Europe.

Locality of specimens in U. S. National Museum collection: Toronto, Canada, (collection W. Brodie); I have seen two specimens reared from galls on Poplar by C. A. Frost, Framingham, Massachusetts, submitted by C. W. Johnson.

55. *Agromyza congregata*, new species.

Male: This species is very similar to *tilia*, but differs as follows: The orbital bristles are four in number, strong and equally spaced; the cheeks are comparatively higher, being at center rather more than one-third the height of eye; the marginal mouth bristles are strong, and form a group at the anterior angle of cheek, amongst which the vibrissa is hardly distinguishable; the entire color of insect is a deep black; the legs are strong and there is no trace of the posterior bristles on the mid tibia; the wing venation is similar to *tilia*.

Length 1.75 mm.

Type: Cat. No. 15589, U. S. N. M.

Locality: Williams, Arizona, May, (H. S. Barber), one male.

Food-plant unknown.

56. *Agromyza minima*, new species.

Male: Frons black, center stripe opaque, orbits and frontal triangle glossy; breadth of frons one-third that of head; orbits narrow, each not one-fourth as wide as center stripe; four rather weak orbital bristles present, the orbits with additional short hairs; face black, opaque, concave in profile, mouth margin produced; cheek black, short, highest at center, where it is about one-fourth as high as eye; marginal bristles of moderate strength, the vibrissa weakly differentiated; occiput not projecting; antennae of moderate size; third joint regularly rounded, distinctly shorter than broad; arista not much swollen at base, tapering, almost bare, its length equal to from its base to almost upper orbital bristle. Mesonotum glossy black, with a slight bluish tinge; two pairs of dorso-centrals present; pleurae concolorous with disk of mesonotum; squamae gray, margin and fringe brown. Abdomen glossy black, with a distinct metallic bluish tinge. Legs black; the posterior mid tibial bristles distinct, though small. Wings grayish; inner cross vein at slightly beyond end of first vein, and at slightly beyond middle of discal cell; outer cross vein at about its own length from inner, and at slightly beyond wing middle; last section of fifth vein barely more than one-half as long as penultimate section; veins 3-4 almost parallel on their last section.

Length slightly over 1 mm.

Type: Cat. No. 15590, U. S. N. M.

Locality: Trinidad, West Indies, June, (A. Busck).

Paratypes: Three females. Those are identical with the male in all essential characters. Localities: Mayaguez, Porto Rico, January, 1899 (A. Busck); Utica, Mississippi, August (no other data); and one specimen taken on flowers of *Bige-
lovia graveolans*, Mescalero, Mexico, October 2, 1896 (T. D. A. Cockerell). Food-plant unknown.

Williston's description of *Agromyza anthrax*.

Trans. Ent. Soc. Lond. 1896, p. 430.

"*Agromyza anthrax*, n. sp."

"Male: Black, but little shining. Front very broad, nearly square, its width rather exceeding its length; opaque black, on its lower margin yellowish. Antennæ black, third joint rounded, large, pubescent, arista very short pubescent. Face receding, excavated, not at all visible from the sides; cheeks linear, with black bristles along the oral margin, and a rather stout vibrissal bristle in front. Palpi projecting beyond the oral margin, yellow. Mesonotum and scutellum a little shining. Abdomen opaque, oval. Halteres yellow. Knees and tarsi yellow, the distal joints of the latter brownish. Wings lightly tinged; the third vein terminates in the apex of the wing; penultimate section of fourth vein about one-third as long as the ultimate section of fifth."

"Length $1\frac{1}{2}$ mm."

"One specimen, St. Vincent."

Owing to the omission to mention the number of dorso-central bristles in this species, and some other essential characters, I cannot place this species in my synoptic table, but in general appearance it must approach very closely to *varifrons* Coquillett.

Williston's description of *Agromyza innominata*.

Trans. Ent. Soc. Lond. 1896, p. 443.

"*Agromyza innominata*, n. sp."

"Male: Head yellow, a blackish spot at the ocelli; front broad. Antennæ yellow; third joint longer than broad; arista finely pubescent. Face short, gently excavated in profile; cheeks rather broad. Palpi elongate, dilated. Thorax obscurely reddish yellow; mesonotum with black hairs. Scutellum large, with two stout, remote, black bristles. Abdomen brown or blackish, yellowish at base. Legs light yellow; hind femora black at the immediate tip. Wings cinereous hyaline; basal cells complete; penultimate section of fourth vein a little longer than the posterior."

"Length $1\frac{1}{4}$ mm."

"One specimen."

"Locality: St. Vincent, West Indies."

I have not seen this species, and cannot place it in my synoptic table from the characters given in the description. No species of *Agromyza* that I have seen has only two scutellar bristles, and the palpi are remarkably large for a species of this genus. The head, with the exception of the palpi, as figured, looks like an *Agromyza*, but the arista is rather strongly pubescent, for most of the species in that genus. I suspect that it does not belong here, and the head figured on page 292 in Williston's Manual, which is quite evidently a reproduction of his figure 158 on Plate 14 of the original publication of the description, being given as "*Agromyza* (nov. gen.?)" in the Manual, would seem to indicate that Williston also thought so in 1903, whatever he may have thought in 1896. No indication is given as to the specific identity of the species, or source from which figure came in the Manual.

Lundbeck's description of *Agromyza arctica*.

Vidensk. Meddel. Copenhagen, 1899, p. 304.

"148. *A. arctica* n. sp. Fig. 4."

"*Brunneocinerea*, thorace opaco, abdomine subnitido, lateribus thoracis maculis flavis ornatis, lateribus abdominis flavis, segmentis abdominis margine posteriore anguste flavescente. Fronte sordide flava, lunula supra antennis flava; antennis flavis, basi et margine exteriori articuli tertii brunnescentibus, arista nigra. Epistomate flavo. Alis hyalinis, leviter flavescentibus, nervo longitudinali quarto in apice alæ excurrente, costa ad apicem nervi longitudinali quarti producta. Halteribus flavis. Pedibus cinerascensibus, geniculis et lateribus inferioribus femorum flavis. ♂ ♀. Long. 2 mm.

"*A. geniculatæ* affinis. Mas. *Brunneocinereus*, thorax opacus, abdomen subnitidum, thorax longe sed parce pilosus, abdomen brevius pilosum, scutellum in margine posteriore quattuor setis longis instructum; latera thoracis dilute cinerea, maculis flavis ornata, latera abdominis tota flava, margines posteriores segmentorum anguste flavescentes (saepe obsolete), metanotum sub scutellum linea flava ornatum. Frons sordide flava, supra antennis lunula flava. Antennæ flavæ, basi et margine dorsali articuli tertii brunnescentibus, arista nigra. Epistoma flavum, occiput brunneogriseum. Alæ hyalinae, leviter flavescentes, nervus longitudinalis secundus et tertius leviter arcuati, ad apicem reflexi, nervus longitudinalis quartus rectus, in apicem alæ excurrere, costa ad apicem nervi longitudinali quarti producta, nerve transversali appropinquati, posterior ante mediam alam situs. Halteres flavi. Pedes cinerei, geniculis et femorum lateribus inferioribus flavis sive refuscentibus. Fem. Mari similis, abdomen ovipositore conico, nigrobrunneo, valde nitido, daubus lamellis nigris, parvis terminato."

"*Individua plures adsunt colore toto et præsertim abdominis dilutiore versimiliter immatura.*"

"Synes at forekomme temmelig almindelig langs hele Vestkysten idet mindste op til 69° N. Br.; træffes især i Pilekrattet, Larven lever maaske i Pileblade. Igaliko-Fjord, Tunugdliarfikfjord, Tassiusak Kristianshaab, Sydstøbtugten (Forf.).

This species bears a resemblance to *borealis* described on a previous page, the venation being almost identical in Lundbeck's figure with that given in this paper for *borealis*, but his description is lacking in several essentials, so that it is not possible to say definitely whether the species are really the same or not.

Cerodontha Rondani.

Syn: *Cerodontha Rondani*, Dipt. Ital. prod. Vol. IV, 1861, p. 10.

Odontocera Macquart, Suit a Buffon, Vol. II, 1835, p. 615 (Preocc.).

Ceratomyza Schiner, Wien. entom. Monatschr. Vol. VI, 1862, p. 434.

Characters of the Genus.

Similar in most respects to *Agromyza*, but the third antennal joint terminates, on the upper surface, in a thorn-like point. The frontal and thoracic bristling is similar in nature to that of *Agromyza*, but in no case have I seen more than two scutellar bristles on the species I have examined; nor do I know of any species in which more than two are present. The mid tibia has no posterior bristles, and the costa always reaches to the fourth vein.

Cerodontha dorsalis Loew.

Plate XXXI, Figs. 33, 39.

Syn: *Odontocera dorsalis* Loew, Dipt. Amer. Sept., Indig., Cent. 1, 1861, species 99.

Male and Female: Frons yellow, opaque, in breadth about one-half that of head; orbits sometimes blackened, very narrow, on upper half each not over one-sixth as wide as center stripe; three distinct orbital bristles present, and on lower portions a few short hairs; proclinate ocellar bristles parallel, or slightly divergent, separated at base by as wide a space as posterior ocelli; antennæ yellow, third joint black, one and one-half times as long as broad, ending in a thorn-like point on upper side; arista black, distinctly thickened at base and tapering to near its middle, pubescence indistinguishable, length of arista short of twice the length of antennæ; face yellow, slightly concave, central keel rounded; cheeks yellow, higher posteriorly than anteriorly, and at highest point about one-half as high as eye, marginal bristles distinct; vibrissa strong, differentiated from marginal bristles; proboscis and palpi yellow; occiput unprojecting on upper half. Mesonotum with disk entirely glossy black, with sometimes an indication of grayish

pollen, or with the central portion in front of scutellum yellow, more rarely with two narrow black stripes on sides, and the central yellow portion carried forward at its anterior margin, slightly beyond middle, as narrow lines which more or less distinctly intersect the broad discal black mark, giving the disk the appearance of having five stripes, or a pattern somewhat similar to that of *Agromyza melampyga*; lateral margins of mesonotum broadly yellow; humeri with a black spot; four pairs of dorso-central bristles on mesonotum; no setulæ on disk; pleuræ yellow with black variegations; squamæ yellow, the fringe brownish or grayish; scutellum all black or with the disk yellow, two scutellar bristles present. Abdomen from almost entirely yellow to almost entirely black, posterior margins of segments narrowly yellow. Legs slender, yellow, sometimes with fore tibiæ and tarsi blackened, all tarsi brownish. Wings as figure.

Length 2-2.5 mm.

The following is a list of the States from which I have seen specimens: Connecticut, Massachusetts, Iowa, Florida, Georgia, District of Columbia, Kentucky, Indiana, Nevada, New Mexico, Texas, Utah, Washington, Tennessee, Nebraska, Michigan, Illinois and California.

I have also seen specimens from Mexico and Porto Rico. The larva mines the stems of grains and grasses.

ADDENDA.

Agromyza quadrisetosa, new species.

Female: Back subshining. Head yellow, ocellar spot, upper third of orbits, back of head, 3rd antennal joint, palpi and upper mouth margin black. Mesonotum with lateral margins broadly pale, whitish yellow, humeri with a black spot; pleuræ with upper margin concolorous with margin of mesonotum; scutellum yellow, margined on sides with black, squamæ yellow. Abdomen black, glossy, the segments with narrow, yellow, posterior margins. Legs entirely shining black. Wings clear, basal portion of veins pale yellow, outer portions brownish. Halteres yellow.

Frons about one and one-third times as long as broad at vertex; orbits glossy, six orbital bristles present, incurved, situated on middle of orbit and of good length; orbits otherwise bare; antennæ of moderate size, third joint rounded, second joint with dorsal bristle distinct; arista tapering, bare, brown in color, equal in length to from its base to second uppermost orbital bristle; cheeks at anterior margin about equal in height to breadth of third antennal joint, at posterior margin equal to slightly more than half of the height of the eye. Mesonotum with 4 pairs of dorso-centrals, between which are 2-3 irregular rows of setulæ which do not extend to posterior dorso-centrals; scutellar bristles (4) subequal. Abdomen with apices of all segments armed with rather strong bristle-like hairs. Legs with mid tibial posterior bristles absent or very weak. Wings with costa to fourth vein; veins 3-4

divergent; outer cross vein at less than its own length from inner and but little beyond end of first vein; last section of fifth vein twice as long as penultimate section

Length 2 mm.

Type: Cat. No. 15957, U. S. N. M.

Type locality: San Antonio, Texas, April 8, 1907 (F. C. Pratt). Nothing recorded of early stages.

This species belongs to the *pusilla* group, but may readily be separated from any of those in this paper by the black palpi, third antennal joint and legs. It is distinct from any of the European species I have examined.

Agromyza melampyga Loew.

This species has been bred by C. R. Jones at San Antonio, Texas, from root of *Plantago media*.

Agromyza citreifrons Malloch.

I had some doubt as to the distinction of this species from *hilarella* Zetterstedt, but I have since examined specimens belonging to the National Museum in Budapest, and consider them quite distinct. *Hilarella* has the frons darker than *citreifrons*, the antennæ darkened on upper surface of third joint, the face less receding, the eyes longer than high, the wings narrower, the inner cross vein distinctly before middle of discal cell, and the last section of fifth vein very distinctly longer than the penultimate section.

Agromyza longipennis Loew.

I have examined specimens from Europe, of *geniculata* since writing the above, and find they are distinct from *longipennis* in having the legs less broadly yellow on joints, the arista almost bare, as against the distinct pubescence of *longipennis*, and the last section of fifth vein distinctly shorter than penultimate section.

Agromyza angulata Loew.

Two specimens submitted as *luctuosa* Meigen from Budapest represent two distinct species, one of which is very close to *angulata* Loew. Under the circumstances I consider that it is not desirable to question the retention of *angulata* as the name for the American species.

Agromyza abnormalis Malloch.

This species differs from *obscuritarsis* Rondani in being more robust, darker in color throughout, and particularly in that the frons and halteres, and in neuration, the last section of fifth vein in *obscuritarsis* being about one and one-half times as long as penultimate section. Both species have 4 pairs of dorso-centrals.

Agromyza kincaidi Malloch.

On comparison of the type of this species with specimens submitted from Budapest museum as *nigripes*, I find that the European form has over all a more glossy black color, the frons is much narrower, being barely wider than width of either eye, and narrowed anteriorly, the arista is almost bare, the squamae are darker, with brown fringes, and the last section of fifth vein is almost as long as the penultimate section.

An example from Hampton, N. H. (S. A. Shaw) agrees in almost every particular with those from Europe so that this species may be added to the American list and the name changed to *subnigripes* n. nom. for the reasons stated in this paper.

Agromyza pruinosa Coquillett.

This species has been reared from larvae mining under bark on birch trees by C. T. Green of the Division of Forest Insects, at Falls Church, Va. I have examined two males which agree in every particular with the type, except in being rather larger.

Agromyza cerulea Malloch.

I have examined a series of 8 specimens reared from *Ipomoea sinuata* and 5 from *Ipomoea lacunosa*, at Victoria, Texas, in September, 1907, and 7 from same locality August, 1907, labelled *Ipomoea*, by J. D. Mitchell. They agree with the Mexican specimen in all particulars.

Agromyza texana Malloch.

Two pairs taken in copula at Kerrville, Texas, June 19, 1907 (F. C. Pratt).

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Names in italics are synonyms.

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The Plates were drawn by W. R. Walton, with the exception of Figures 14, 15, 30, 34, and 38, which are by the author.